Culturally Tailored ICT4D

Designing *with* Communities, Culture and Context

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Certificate of Original Authorship

I, Susan Hansen declare that this thesis, is submitted in fulfilment of the requirements for the award of Doctor of Philosophy in Computing Sciences, in the School of Software, Faculty of Engineering and Information Technology at the University of Technology Sydney.

The thesis is wholly my own work unless otherwise reference or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

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Abstract

This thesis describes my research journey as it evolved from designing a mobile health application, to the production of Interplay, an educational play about the internet. The research was part of an Information and Communication Technology for Development (ICT4D) project based in the Eastern Cape Province of South Africa. A key aim of my research was to make a positive contribution to the Siyakhula Living Lab, a large collaborative ICT4D venture between Rhodes University, the University of Fort Hare, industry partners, government and community members.

Participatory action research and participatory design provided the methodological foundations for the three cycles of research that took place over three years between 2009 and 2012. The research involved a series of stakeholder interviews, fieldwork, introductory workshops and the design and development of an educational play. Methods used and findings throughout the research journey are detailed, from the first cycle trying to understand the local and project context with the hope of making a positive contribution, through to the final cycle involving the premiere performances of the educational play, Interplay.

This thesis advocates the greater use of culturally tailored methods in ICT4D. Research findings support using participatory methodologies and culturally tailored methods to increase the chances of making a positive impact in ICT4D projects and to reduce the risk of harm to participants and their communities. The major contributions of this thesis are methodological. In particular it:

1. Demonstrates the value of conducting stakeholder interviews in an ICT4D project,
2. Demonstrates the role of social relationships in enabling active participation in an ICT4D project,
3. Demonstrates how cultural factors influenced the choice and use of methods in an ICT4D project, and

4. Provides a case study of the creation of a culturally tailored method to support mutual learning in ICT4D.

Finally, Interplay itself exists as a tangible outcome and contribution of this research. It continues to be used to enable learning about the opportunities offered by the internet within communities in the Eastern Cape Province of South Africa.

1

Introduction

This chapter provides an overview of my research carried out over three years in the area of Information and Communication Technology for Development (ICT4D). My research background is shared, followed by a description of the South African project context where the majority of my research took place. An overview of the research aims and key research contributions is provided. The chapter concludes with an outline of the structure of this thesis.

> *To hell with good intentions… You will not help anybody by your good intentions (Illich, 1968)*

The area of Information and Communication Technology for Development (ICT4D) offers great potential, for utilising Information and Communication Technologies (ICTs) to improve the lives of socioeconomically disadvantaged communities. The quote by Ivan Illich may seem like a strange way to begin a thesis, but Illich captures beautifully, a sentiment that my own experience working with socioeconomically disadvantaged communities supports. It comes from a transcript of a speech that Illich, a Roman Catholic Priest and philosopher, gave to a group of American students in 1968 who were about to commence a summer volunteer program in Mexico. In his speech, Illich lists multiple ways that students may unintentionally cause harm. He then argues strongly that they are unable to do good in a month and concludes by urging the students to cancel their trips. In ICT4D, despite no shortage of good intentions, most interventions fail (Dodson, Sterling & Bennett 2012). Good intentions and potential alone are not enough to guarantee well intended ICT4D projects' success or protect projects against having harmful or negative impacts.

This thesis chronicles my research as I grappled with the challenges of turning good intentions into a useful and ongoing contribution. In essence, it is a case study that supports the use of participatory methodologies to increase the chances of going beyond good intentions to contribute positively to communities and reduce the risk of harm. In particular, the thesis advocates investing time in building strong relationships with communities and using culturally tailored methods to better empower meaningful voices of community members. By culturally tailored methods I mean design approaches and methods that have been chosen and/or developed for the local context of an ICT4D project.

This introductory chapter provides an overview of my research background, context and contribution. It is divided into the following sections:

- Section 1.1 provides the background and motivation of my research, including my personal research background,

- Section 1.2 describes the research context,
- Section 1.3 provides an overview of my research,
- Section 1.4 summarises my contributions, and
- Section 1.5 is an overview of the chapters in my thesis.

1.1 Background

My research began with the aim of investigating how ICTs could be used for delivering services, such as health services, to socioeconomically disadvantaged communities. Specifically, I wanted to contribute to the design and implementation of a mobile health application for such a community. The secondary aim was to identify and explore challenges associated with designing technology for communities in developing countries and emerging economies.

My interest in this area developed during my involvement in the design, development and implementation of two major telemedicine systems designed to deliver health services to regional areas in Australia while working at the Commonwealth Scientific Industrial Research Organisation (CSIRO). I was introduced to participatory design during the second project. It was also in this project that I gained experience in applying an action research inspired approach. In both projects, I witnessed the potential for technology to deliver health services to regional and remote communities. These experiences shaped my interest in how the various insights and outcomes from these projects could be extended to designing technology to improve access to services of socioeconomically disadvantaged communities in emerging economies.

Working in user experience for over five years gave me an awareness of the importance of understanding people and their context when designing technology solutions. I also became aware of the relatively high number of technology projects that made incorrect assumptions about user needs and user contexts and, most importantly, how often these incorrect assumptions led to implementation failures. So, I spent the six months before formally beginning my PhD research seeking a project in a location where I would be able to spend significant time. My

search led me to the Siyakhula Living Lab based in Grahamstown, South Africa. The Siyakhula Living Lab was established to support collaboration between universities, industry partners, government departments and community stakeholders in the investigation of the use of ICTs in marginalised communities in South Africa. Details of the Siyakhula Living Lab and communities involved in my research are summarised in the next section. The process of finding a suitable site for my research is discussed later in Chapter 3, (Section 3.6).

1.2 Research context

There were two academic homes for my research. The Interaction Design and Human Practice Lab at the University of Technology Sydney was my university base, the site of my primary supervision and where I received significant guidance relating to the participatory design methodological approach taken. The other was the Computer Science Department at Rhodes University in Grahamstown, South Africa, where most of my research was carried out and which served as my primary research base. The research in this thesis was part of program of work in the Siyakhula Living Lab. A brief introduction to the Siyakhula Living Lab is presented in this section. In addition, two of the communities involved in my research are described, that is, the Mbashe Municipality in the former Transkei and the Joza township, Grahamstown. Key research locations in South Africa are presented below in Figure 1.

Figure 1 Key South African research locations

1.2.1 Siyakhula Living Lab background

The Siyakhula Living Lab is a large collaborative initiative between Rhodes University, the University of Fort Hare, industry partners, government departments and communities (Gumbo et al. 2012). It was launched in 2006 and is run within the Telkom Centres of Excellence in the Computer Science Department at Rhodes University and the University of Fort Hare (Slay & Dalvit 2008). A Living Lab can be described as "an approach that deals with user driven innovation of products and services that are introduced, tested and validated in real life environments" (Mulder et al. 2008, p.8). The primary objective of the Siyakhula Living Lab is to create, test and deploy ICT solutions to empower and benefit marginalised communities in South Africa, where a large number, 42.5%, of the South African population live (ESTIMA 2009). Another objective is to develop the technical capacity of people living in marginalised communities (Khane et al. 2011). In addition, the Siyakhula Living Lab provides students from Rhodes University and the University of Fort Hare the experience of working on real-life rural ICT projects.

The Siyakhula Living Lab builds on relationships that were established by the Anthropology Department at Rhodes University in the mid-1990s in a project designed to include residents in the Dwesa-Cwebe area of the Mbashe region as co-owners and active partners of a small nature and marine reserve in the area (Palmer, Timmermans & Fay 2002). Members of the community chose the name 'Siyakhula', meaning 'we are growing' in isiXhosa, the Xhosa language, which is the main first language spoken in the Eastern Cape Province. The name 'Siyakhula' was chosen to reflect their intended active participation in the project (Pade et al. 2009). The existing relationship with the Anthropology Department provided the entry into the community by the Computer Science Department and the Siyakhula Living Lab.

1.2.2 Mbashe region

The majority of the communities involved in the Siyakhula Living Lab were in the Mbashe Municipality of the Wild Coast area of the former homeland of Transkei, in the Eastern Cape Province, South Africa. This has been referred to throughout this thesis in a truncated form as the Mbashe region in the former Transkei. The former Transkei was one of ten designated homelands where citizenship was allocated based on ethnicity. It was one of two homelands created for the amaXhosa, the Xhosa people, and the first of four homelands to attain independence in 1976, meaning it had the power to govern itself without interference from the South African government (Segar 1989). Apartheid, which translates literally as 'apartness' in Afrikaans and Dutch, was a system of institutional racial segregation that existed in South Africa between 1948 and 1994 (Clark & Worger 2016). The homelands, such as the former Transkei, were one of the cornerstones of South Africa's apartheid policy (Segar 1989).

Today the former Transkei, including the Mbashe region, is one of the most socioeconomically disadvantaged areas of South Africa. The former Transkei benefits from a rich oral traditional and contemporary culture, as discussed by Kaschula (2002), however, there are low levels of literacy in this deeply rural area. In addition, the majority of people living in the Mbashe region only speak isiXhosa.

The Mbashe region was the primary area of interest in research cycle A. When my research with the Siyakhula Living Lab formally began in 2010, the majority of households in the Mbashe region did not have direct access to electricity or running water. The road infrastructure in the area was also limited, rough and basic. However, despite the limited basic infrastructure, the overwhelming majority of households in the Mbashe region had access to mobile phones and mobile phone reception. This presented an exciting opportunity to explore the use of ICTs for providing services to these socioeconomically disadvantaged communities.

1.2.3 Joza township

The Joza township is where the Egazini Outreach Project is based. The Egazini Outreach Project, an initiative involving a number of local artists, was the focus of research cycles B and C. Surrounding most major towns in South Africa are townships, commonly referred to as 'locations'. Elsewhere in the world they may be referred to as informal settlements or shanty towns. The prevalence of townships in South Africa is another remnant of the apartheid era. The townships surrounding Grahamstown house roughly double the population of Grahamstown itself. Joza township is one of the largest townships of Grahamstown. Access to basic infrastructure, such as electricity, running water and roads, is better than rural areas like the Mbashe region of the former Transkei, however, it is still varied and significantly more limited than in city and town centres. In addition, the unemployment rate is very high (somewhere around 65%) as is the incidence of crime. Literacy rates are also low and the majority of people live in relative poverty. IsiXhosa is the most common language spoken in Joza township, but many people have at least a basic understanding of English or Africaans. Similar to the Mbashe region in the former Transkei, the majority of households have access to mobile phones and mobile phone reception.

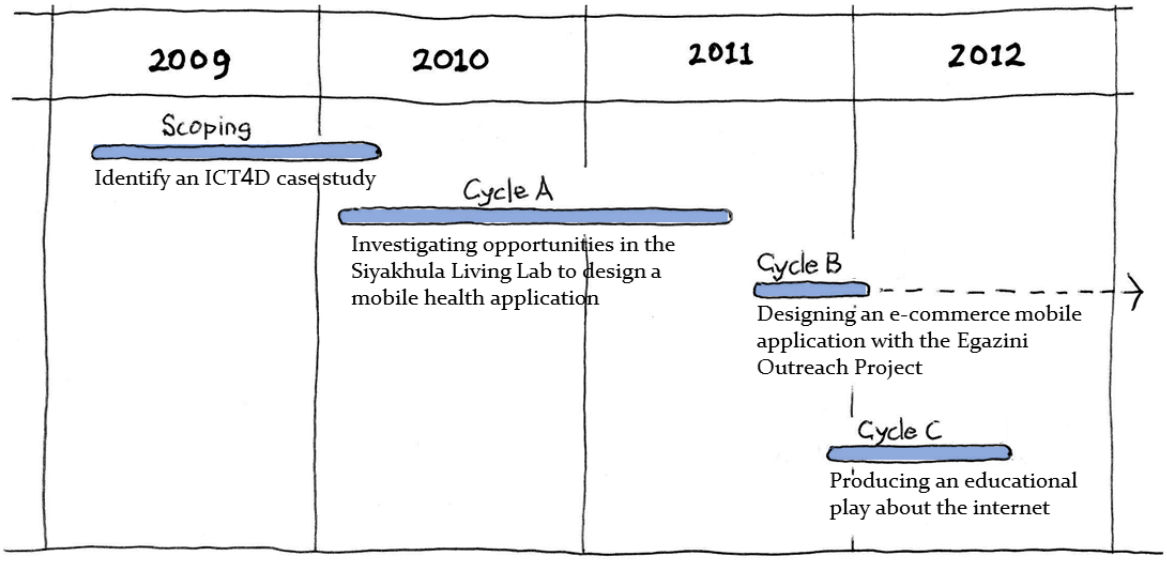
1.3 Research overview

Participatory action research and participatory design advocate the importance of investing time in building relationships, as well as inclusive and genuine

participation in design research and practice. My exposure to, and experience with participatory approaches shaped my commitment to finding a research project that intended to make a useful contribution to those participating in it and find a context where my interests and skills could add value.

After investigating several potential locations and projects for my research, I joined the Siyakhula Living Lab. Within the Siyakhula Living Lab project, my research underwent two significant changes in direction resulting in three research cycles in total. With each cycle, the aims and research questions were revisited and updated. As the research evolved, the research aims and questions became more focussed. However, the aim to make a positive contribution to the Siyakhula Living Lab remained consistent across all cycles. A high-level overview of my research is provided in this section and visualised in Figure 2. A summary of the scoping phase and three cycles of research is detailed in sections 1.3.1 to 1.3.4. This is followed by a summary post-script to the research in Section 1.3.5.

Figure 2 Research journey timeline



1.3.1 Scoping phase

The first step in my research was to identify a location and project for my research. At this stage I planned to work on two to three case studies, including one in

Australia with an Indigenous community. I was made aware of how critical and time-consuming building trust could be with Indigenous communities by former colleagues. So, I decided to explore overseas opportunities at the same time as keeping an eye out for projects in Australia. My overseas exploration involved several trips to different locations, including Vietnam, Laos and two communities in South Africa, before becoming part of the Siyakhula Living Lab project in South Africa. The scoping phase in the two South African trips involved not only visiting various research locations, but also meeting with several people involved in two different projects and participating in small research projects.

1.3.2. Research cycle A

The first cycle of my research focussed on understanding both the Siyakhula Living Lab project context and South African local context with the plan to use this understanding to shape the design of a mobile health application. A series of interviews were conducted with 25 key stakeholders involved in the Siyakhula Living Lab to gain a comprehensive understanding of the project context and to explore opportunities for my contribution. In addition, five field trips were made to Dwesa in the Mbashe region, I completed a Rhodes University staff Xhosa language short course that enabled me to communicate in Xhosa at a basic level and reviewed a broad selection of local media including films, documentaries and novels. These research activities provided an opportunity to establish and build relationships with the project team, which in turn, provided a strong foundation for research cycles B and C. The findings from research cycle A contributed to my understanding of the project and local context and led to significant change in research focus. The focus changed from designing a mobile health application for communities in the Mbashe region, to designing an e-commerce application for the Egazini Outreach Project in Joza Township. The key reason for this change was in response to realising the limited engagement that the Mbashe community members had with the Siyakhula Living Lab, which would make developing an e-health application not possible in the remaining time. Designing an e-commerce application for the Egazini Outreach Project seemed to be more realistic due to the significantly better infrastructure available to the Egazini Outreach Project, as well

as its proximity to my research base in Grahamstown. It was also in research cycle A that I decided to narrow my research focus to a single country as it was clear by then that the time investment required to build relationships and understand the cultural context would only leave enough time for research in one country.

1.3.3 Research cycle B

The second cycle of my research focussed on understanding the Egazini Outreach Project artists with the hope of designing an e-commerce application to help them sell their artwork. Two scoping visits, five introductory workshops and over 30 informal site visits took place. In addition, disposable cameras were used in the spirit of cultural probes to gain insight into the Egazini artists' context. Introductory workshops and other activities contributed to building trust and relationships with the Egazini artists and as well as understanding their needs and motivations. It was clear from the first introductory workshop that although members of the Egazini Outreach Project had heard of the internet, most of them did not seem to know much about it. The general lack of understanding of the internet and the use of storytelling, as the traditional way of passing on knowledge for the Xhosa people, were catalysts for the creation of an educational play to communicate the possibilities of the internet.

These early findings in research cycle B triggered research cycle C, the final cycle, which centred on the use of storytelling to communicate the possibilities the internet offered. Research cycle B was short, however there was an overlap with cycle C as some activities with the Egazini artists, for example the informal site visits, continued throughout cycle C.

1.3.4 Research cycle C

The third and final cycle of my research focussed on the creation and initial performances of Interplay, an educational play about the internet, and one of the major contributions of my research. Another aim of research cycle C was to ensure benefit to the Egazini artists remained once my PhD research was complete.

1.3.5 Wrap up and post-script

In part due to the use of participatory action research in this project, the relationships with participants and my involvement in the research did not cease after completing the formal stage of my research. Two examples of significant events that followed the formal completion of my research were: 1) the workshopping of Interplay with the Swallows Foundation, an arts and culture partnership between the North East of England and the Eastern Cape of South Africa (Swallows Partnership 2016), and 2) Interplay's continued performance in schools for at least three years after I left South Africa.

1.4 Key contributions

The major contributions of this thesis are methodological and of particular relevance to the ICT4D community. In addition, Interplay exists as a tangible outcome of this research. These contributions are summarised below.

1. *A demonstration of the value of conducting stakeholder interviews in an ICT4D project.*

   The value of conducting stakeholder interviews, particularly in large collaborative ICT4D projects was investigated in a series of interviews with stakeholders of the Siyakhula Living Lab. While the findings from the interviews are a contribution in their own right, important insights from them enabled a relevant contribution to an ICT4D project. Nine broad categories of the value of stakeholder interviews are identified. These may also be useful to other ICT4D projects.

2. *A demonstration of the role of social relationships in enabling active participation in an ICT4D project.*

   Social relationships played a key role in both enabling my research to take place and in generating alternate research directions for research cycles B and C. The relationships with the project team at the Siyakhula Living Lab and with the Egazini Outreach Project artists were central to the project outcomes presented in this thesis.

3. *A demonstration of how cultural factors influenced the choice and use of methods in an ICT4D project.*

   The cultural context of the artists from the Egazini Outreach Project played a crucial role in shaping the choice and use of methods in cycle B and C of the research. Most importantly, the cultural context was the prime motivator for creating an educational play about the internet.

4. *A case study of the use of a culturally tailored method to support mutual learning in ICT4D.*

   This thesis presents a case study of the production of Interplay, an educational play for an isiXhosa audience who may speak little or no English, to support learning about the internet.

Finally, Interplay itself is a tangible outcome and contribution of this research. It continues to be used, updated and adapted to enable learning about the internet and its potential use within communities in the Eastern Cape Province of South Africa.

1.5 Chapter overview

A summary of the chapters that follow is provided below as a guide to the structure of this thesis.

- **Chapter 2** is *a review of the literature* of Information and Communication Technology for Development (ICT4D) to provide the foundation for the research questions explored and to situate my research contributions.

- **Chapter 3** is an account of the methodology and my research journey, and is divided into two parts. *Part one* describes the research methodology beginning with an overview of participatory approaches. It then describes the participatory action research framework adopted. *Part two* is an account of the research itself. It includes a description of the scoping phase and subsequent three research cycles.

- **Chapter 4** outlines the motivations, study design, selected findings and discussion of the stakeholder interviews, the key research activity of research *cycle A*. This chapter also reflects on the broader value of conducting stakeholder interviews in ICT4D projects, including how the stakeholder interviews enabled a relevant contribution to the Siyakhula Living Lab.

- **Chapter 5** explores the background of the Egazini Outreach Project and describes the various activities that took place with the Egazini artists, the focus of research *cycle B*. Findings relating to the Egazini Outreach Project provide helpful context for the educational play produced in cycle C, as well as insights that can be applied to other ICT4D projects.

- **Chapter 6** provides an account of how Interplay, a culturally tailored method to support mutual learning in ICT4D design, came to be. The creation of Interplay was the focus of research *cycle C* and the play itself is a major contribution of my research. This chapter includes an account of the process of its production, description of its premiere performances and discussion of findings from the experience.

- **Chapter 7** reflects on the methodology and methods used in my ICT4D research. A summary of the benefits and weaknesses of the key methods used is provided along with a general discussion of my experiences using them in this research. These reflections are presented as a contribution to the dialogue on methodology and methods used in ICT4D.

- **Chapter 8** provides a summary of my research and concludes this thesis. The aims and research questions are revisited, along with the core findings and contributions. Finally, a brief post-script to the research is provided and potential areas of future work suggested.

2

Information and Communication Technology for Development (ICT4D)

This chapter presents a review of literature in the area of Information and Communication Technology for Development (ICT4D) to provide a foundation for the research questions explored in this thesis and to situate the thesis research within the ICT4D literature.

Information and Communication Technologies for Development (ICT4D) is a multidisciplinary field of research and practice that explores how Information and Communication Technologies (ICT) can be applied to address the needs of poor, marginalised and underserved populations (Unwin 2009). These are often geographically isolated and socioeconomically disadvantaged populations in emerging economies with limited access to technology due to economic, cultural, political, geographic or social reasons. The foci of ICT4D projects include the design, development, training, and investigation of the uses of ICTs. In general people from Computer Science, Information Systems or Development Studies lead ICT4D projects (Heeks 2009). However, the disciplinary backgrounds of people working in this field are wide and varied with Computer Science, Information Systems, Anthropology, Sociology, Design and Development Studies being the most common (Van Biljon & Alexander 2015).

This literature review begins with a historical account of ICT4D and recent trends. A section on Human-Computer Interaction (HCI) and its related sub-field of Human-Computer Interaction for Development (HCI4D) follows this. The literature review then continues with the identification and description of three primary approaches to ICT4D projects. These are: 1. *Technology focussed* approaches; 2. *Generic design research* approaches; and 3. *Culturally tailored* approaches. The presentation and discussion of these primary approaches makes up the remainder of the chapter.

2.1 ICT4D history and trends

The use of digital technologies in developing countries can be traced as far back as 1956 when the first digital computer was installed at the Indian Institute of Statistics in Kolkata (Heeks 2008). Since this time there have been many technology initiatives globally, in particular linked to development aid, engineering, or social enterprise related projects. However, it is only in the mid to late 1990s that ICT4D, as a field in its own right, started gaining momentum. Two major developments provided the catalyst for the growth of ICT4D: 1) The internet; and 2) The Millennium Development Goals (Heeks 2008). The Millennium

Development Goals, which were set by world leaders at the beginning of the millennium as a goal to be achieved by 2015, are presented below in Table 1 (from United Nations 2015).

Table 1 The Millennium Development Goals

	Goal
1	Eradicate extreme poverty and hunger
2	Achieve universal primary education
3	Promote gender equality and empower women
4	Reduce child mortality
5	Improve maternal health
6	Combat HIV/ AIDS, malaria and other diseases
7	Ensure environmental sustainability
8	Develop a global partnership for development

The beginning of the formal recognition of ICT4D as a field of research is marked by the first International Conference on Information and Communication Technologies and Development, (ICTD), held at the University of California, Berkeley in 2006 (Ho et al 2009). From 2006 until 2015, the ICTD conference has been held approximately every 15 to 21 months at various locations around the world – including Bangalore, India (2007), Doha, Qatar (2009), London, England (2010), Atlanta, USA (2012), Cape Town, South Africa (2013) and Singapore (2015). The increased access and ownership of mobile phones in emerging economies and decreasing cost of tablets, netbooks and laptops have fuelled the growth, interest and participation in this field. As a result, it was decided that the ICTD conference would be held more regularly starting from the 2016 conference in Michigan, USA 13 months after ICTD 2015 in Singapore. The most recent ICTD conference locations were Lahore, Pakistan (November 2017) and Ahmedabad, India (January 2019).

ICT4D is still a relatively new field, which, combined with the rapidly evolving technological landscape means that there is less consensus on theories and frameworks in ICT4D compared with other academic areas with a longer history

(Hilbert 2012; Raiti 2006; Van Biljon & Alexander 2015). Recently however, there has been an increase in effort and number of initiatives geared towards creating a more coherent, unified identity for the field. These include workshops at major international conferences, for example the 'Researching for change in a globalising asymmetric world' workshop at the Critical Alternatives conference in Aarhus, Denmark in August 2015 (Blake et al. 2015), the 'Development Consortium: HCI Across Borders' two day workshop at CHI 2016 and the two day ACM CHI Symposium on HCI across borders at CHI 2017 – the largest, and one of the most prestigious annual Human-Computer Interaction conferences in the world.

A helpful summary of ICT4D's origins and early phases until the late 2000's is provided by Richard Heeks, one of the leading and most widely cited researchers in the field[1], in 'The ICT4D 2.0 Manifesto: Where Next for ICTs and International Development?' (Heeks 2009). Key aspects of the three phases identified by Heeks: ICT4D 0.0, ICT4D 1.0 and ICT4D 2.0 are outlined in Table 2, (adapted from Heeks 2009, p28).

[1] As of October 2018, Richard Heeks had over 18400 citations and an h-index of 57 according to Google Scholar (Google Scholar 2018).

Table 2 Summary of ICT4D phases

Phase	ICT4D 0.0 (1960s - mid 1990s)	ICT4D 1.0 (mid 1990s - mid 2000s)	ICT4D 2.0 (mid 2000s onwards)
Iconic Technology	PC database	Telecentre	Mobile phone
Key Application	Data processing	Content & interaction	Services & production
The Poor	Who?	Consumers	Innovators & producers
Key Goal	Organisational efficiency	Millennium Development Goals	Growth & development
Key Issue	Technology's potential	Readiness & availability	Uptake & impact
Key Actor	Government	Donors & NGOs	All sectors
Dominant Discipline	Information Systems	Informatics / Development Studies	Computer Science, Information Systems & Development Studies
Development Paradigm	Modernisation	Human development	Development 2.0

According to Heeks, ICT4D phase 0.0 focussed on technology for achieving organisational efficiency and modernisation, primarily in the public sector in developing countries (Heeks 2009). Phases 1.0 and 2.0 attempt to go beyond introducing efficiency and modernisation by aiming to contribute to development and growth. Phase 1.0 focused specifically on meeting the Millennium Development Goals while the focus of Phase 2 prioritised growth and development. Both Phases 1.0 and 2.0 also recognised issues relating to uptake and impact.

The summary in Table 2 is helpful for the information it contains and the overview it provides of the evolution of ICT4D. However, the focus of Heeks' analysis is on actors and goals, and information such as methods and approaches, is not included. This means that the summary does not lend itself easily to capturing different methodological approaches. For example, the role (or lack of role) of community members who may use a technology solution in the design and implementation stages of a project is not captured. The omission of how community members can impact a project's success in Heeks' summary may indicate a lack of prioritisation of this factor in the ICT4D literature.

Nevertheless, some leading figures in the ICT4D field recognise the importance of engaging communities more closely in the design process and in meaningful ways (e.g. Dearden & Tucker 2016 and Unwin 2009). Approaches to ICT4D that could be considered complementary to Heeks' ICT4D 2.0 are gaining momentum. These include projects that use various ways of engaging people developed in Human-Computer Interaction (HCI) and Participatory Design (PD). In addition, there are a growing number of projects that use non-Western, non-traditional social science approaches to involve marginalised communities in the design and implementation of a project (e.g. Chavan 2005; Medhi & Toyama 2007).

Despite these new approaches gaining momentum, the increasing number of projects that are engaging community members and the growing body of ICT4D literature, there are still relatively few studies that explore and reflect on the different ways of engaging community members, the value of their participation and the impact that their inclusion or exclusion in an ICT4D project has. Notable exceptions include: Suchman (2002), Light et al. (2010), Winschiers-Theophilus et al. (2010), Bidwell et al. (2011), Brereton et al. (2014), Le Dantec & Fox (2015), Rey-Moreno et al. (2015), Taylor et al. (2016) and Khumalo & Pather (2018).

2.2 Human-Computer Interaction (HCI) and Human-Computer Interaction for Development (HCI4D)

Human-Computer Interaction (HCI) is a field of research that explores people's interaction with computers and seeks to improve the design of ICTs by focussing on human-centred design issues and approaches. Human-Computer Interaction for Development (HCI4D) is a subset of work in ICT4D and draws on practices and principles from HCI. Section 2.2.1 briefly describes HCI to provide background context for HCI4D, which is summarised in Section 2.2.2.

2.2.1 Human-Computer Interaction (HCI)

The field of Human-Computer Interaction emerged partly as a response to the growing number of people outside the engineering discipline who were using computers as a tool to assist their everyday lives (Bannon 1991). These people recognised the potential for computers to improve their work but were frustrated

with both how difficult they were to use and learn to use. A stronger coupling was needed between what made sense to users and how features could be accessed (Myers et al. 1996). HCI initially focussed on this problem, with an emphasis on the user interface, software and hardware. Over time, the remit of HCI expanded as technology became increasingly prevalent and our understanding of the various factors contributing to the experience of its use and uptake has improved. For a comprehensive account of the history of HCI, see 'From Tool to Partner: The Evolution of Human-Computer Interaction' by Jonathan Grudin (2017).

There is no formal agreed on definition of HCI, but in the interest of deriving and developing educational material, the ACM (Association for Computing Machinery) presents a definition of HCI as follows:

> "Human-Computer interaction is a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them." *(Hewett et al. 1992)*

While this definition is incredibly broad, the ACM acknowledges that from a Computer Science perspective, one of the dominant disciplines in the field, the focus is on interaction between one or more humans and one or more computational machines. This has been the case particularly in the early days of HCI, as reflected in the early conference proceedings of CHI. Most importantly, the last clause of the ACM definition emphasises that the major phenomena surrounding the design and evaluation of ICTs is an integral part of the field.

In its early days, the 1980s – 1990s, a lot of work in HCI focussed on usability (e.g. Preece et al. 1994). Usability studies explored how easily people completed tasks, as well as understanding, interacting and finding things on a computer interface. The identification of where and why people were having issues were then used to improve the design and usability of an interface.

Methods applied in HCI have drawn on both the sciences, such as Cognitive Psychology, and the social sciences, such as Anthropology and Sociology. Studies

range from controlled experiments conducted in a laboratory environment to exploratory ethnographic fieldwork conducted in community or organisational settings. These studies typically involve the use of a combination of quantitative methods, for example the use of surveys to measure satisfaction and perceived usability and recording metrics such as the number of tasks completed successfully and task-completion time; and qualitative methods, for example interviews to understand peoples' needs and motivations, fieldwork and observations to better understand the context in which a solution will be used.

HCI has evolved along with the technology that concerns it. The range of methods borrowed and adapted from other disciplines, such as Psychology and Sociology has expanded while the range of research has broadened. The combination of the expansion of methods and tools used as well as what is investigated has contributed to the increasingly blurred lines between HCI and other related design and technology related fields.

For example, while early HCI projects focussed on how people interact with interfaces and creating an optimal fit, more recent HCI projects extend beyond this to the experiential quality of interaction, its impact on meaning and the significance of context (Harrison, Tatar & Sengers 2007). This acknowledges that the success or failure of a technology is not only due its usability, but also due to peoples' perceived value of the technology as well as the organisational, social, political and environmental context and constraints that may influence their ability to use it regardless of their interest in doing so.

2.2.2 Human-Computer Interaction for Development (HCI4D)

HCI4D is a community of practice or subset of HCI that applies HCI methods and practices in a development or emerging economies context. It naturally falls within the field of ICT4D, but its focus and primary audience is often the wider HCI community (e.g. Ghosh, Parikh & Chavan 2003; Light et al. 2010; Reitmaier, Bidwell & Marsden 2011; Taylor et al. 2016).

The beginning of the recognition of HCI4D as an emerging community of practice was arguably the "User Centred Design and International Development Workshop" run by Dearden et al. (2007) at the CHI 2007 conference in San Jose, California. The 2007 CHI workshop was the second attempt at running such a workshop after a similar one failed to attract sufficient interest at the much smaller 2006 Participatory Design Conference in Trento, Italy. The 2007 workshop was followed by the "HCI for Community and International Development" workshop run by Thomas et al. (2008) at CHI 2008 in Florence, Italy. The topic of HCI4D has since had a growing presence at the annual CHI conference with a 'spotlight' or special attention drawn to the topic at the CHI 2014 conference in addition to annual workshops between one and two days on the topic of HCI4D. The most recent workshop was a one-day symposium "HCI Across Borders – Paving New Pathways" run by Kumar et al. (2018) at the CHI 2018 conference in Montreal, Canada.

HCI4D captures a broad range of projects because of its use of methods and approaches borrowed from many fields, for example Participatory Design, Computer Supported Cooperative Work (CSCW), Psychology, Design, Sociology and Anthropology, to name a few. It is difficult to define a HCI4D project, in part because the definition is dependent on the self-identification of the researcher or practitioner. Despite the challenges defining what constitutes an HCI4D project, the growing numbers of people who identify as being part of the HCI4D community demonstrates its relevance to both the HCI and related fields and to ICT4D more broadly.

When I began my research in 2009, HCI4D offered useful concepts and ideas not prevalent in the broader ICT4D field. Indeed, my research is situated in the space common to HCI4D, along with participatory design, interaction design, action research and several other related approaches. The methodological situating of my research will be further expanded on in the next chapter, on methodology. Due to the overlapping and unclear boundaries defining which projects are classified as HCI4D, the remaining parts of the literature review and thesis will refer to all projects in the area of ICT4D, including HCI4D projects, as simply ICT4D.

2.3 Three primary approaches to ICT4D

The major contributions of this thesis are methodological, however I found no suitable framework for structuring methods and methodological approaches of ICT4D projects in the literature. Nor did it seem appropriate to extend Heeks' summary of ICT4D phases to include methodological approaches, as they did not map easily or neatly onto his phases ICT4D 0.0., 1.0 and 2.0. Instead, I have structured my discussion of the ICT4D literature according to three primary approaches. These are: 1. *Technology focussed* approaches; 2. *Generic design research* approaches; and 3. *Culturally tailored* approaches. Before describing these, it's worth noting that these approaches are not mutually exclusive. Many ICT4D initiatives will likely contain elements of more than one approach. However, a dominant approach can usually be identified.

Technology focussed ICT4D include projects and initiatives that prioritise setting up infrastructure and training people to use technology. It can also include projects that introduce off the shelf technology to communities in emerging economies or even the creation of technology explicitly for these communities.

Generic design research approaches include projects that apply design research methods to understanding an ICT4D context that have been primarily *developed in a Western context* for the purpose of research and design in a Western context. ICT4D projects that fit in this category generally do little or no tailoring for cultural context to the design methods used in a project. Instead, a 'one-size-fits-all' application of methods takes place. Arguably, the use of *generic design research* approaches is currently the dominant approach in ICT4D.

In an ICT4D setting, I use *culturally tailored* approaches to refer to the consideration of the cultural and social context when choosing or developing methods and approaches in ICT4D projects. *Culturally tailored* projects include projects that adapt existing methods for the cultural context of the project, as well as creating methods specifically for a project's context. In addition, there is often a commitment to empowering communities to have a significant voice in the design

process and an awareness and sensitivity to the impact that the researchers' engagement may have on a community regardless of the project outcome.

For each of these approaches, the following details are outlined:

- Dominant discipline and philosophy,
- Common key drivers,
- Community involvement and evaluation methods, and
- Case study examples.

2.4 Technology focussed ICT4D

The key characteristic of *technology focussed* ICT4D is a *focus on technology*, that is, a prioritisation on finding or creating a technology solution. Technology focussed ICT4D may or may not consider the impact on communities or cultural fit. Many projects that Heeks (2009) describes as ICT4D phase 0.0 and ICT4D phase 1.0 fit neatly into this category for example, the One Laptop per Child (2017) and Hole in the Wall (Mitra 2003; Mitra et al. 2005) projects.

A flagship technology focussed ICT4D example is the rural/remote telecentre that is intended to provide access to computers and the internet in rural and remote communities. A telecentre is defined as a room or building with one or more internet connected personal computers. Examples of telecentre initiatives include InforCauca in Columbia (Amariles et al. 2007), Multi-Purpose Community Centre (MPCC) in South Africa (Van Belle & Trusler 2005) and Gyandoot in India (Jafri et al. 2002). Despite the wide scale role out of telecentres over a period of years in many locations, there are very few examples of success (Unwin 2009). Best and Kumar (2008) studied 78 telecentres over a period of three years hoping to uncover factors contributing to sustainability. Thirty-six of these telecentres were private and 42 were opened and run by a local NGO. At the conclusion of the three year study, the majority of the private telecentres, 32 of 36, had closed, whereas the majority of NGO supported telecentres continued to operate. In addition to lack of institutional support, Best and Kumar (2008) identified lack of technical support, lack of institutional partnerships and lack of new and relevant content as

the key contributors to failures (Best & Kumar 2008). A detailed account of telecentres is beyond the scope of this review, however, a comprehensive study by Kuriyan and Toyama (2007) exploring rural telecentres in India, Ghana and Kenya over a period of three years uncovered many social, technical and economic reasons for telecentres' failures. Reasons for failures uncovered in their study include the gap between what rural villagers want and what implementing agencies think they want.

Another notable example of technology focussed ICT4D is the MIT Fab Lab, with the first Fab Lab's set up outside MIT in 2002 in San Jose, Costa Rica and Vigyan Ashram in India (Mikhak et al. 2002). Fab Lab's are laboratories that have equipment to enable innovation and invention, for example, 3D printers, to enable local people to create tools. A Fab Lab Foundation was set up in 2009 to help support the growth of the international Fab Lab network with the intention of improving lives and livelihoods around the world through technology. As of 2018, the Fab Lab global network has expanded to approximately 1000 labs in more than 78 countries worldwide (Fab Foundation 2018).

A brief description of the dominant discipline and philosophy; common key drivers; and involvement of community and evaluation approaches for *technology focussed* ICT4D projects are detailed below along with two case studies, One Laptop per Child (OLPC) and Hole-in-the-Wall.

2.4.1 Dominant discipline and philosophy

The dominant disciplines involved in *technology focussed* ICT4D projects are Computer Science, Informatics and Development Studies. The driving belief is that access to information and services is 'good' and this access can be achieved through ICTs. Even though some individual project team members may consider both the potential positive and negative impact of their technology intervention, there is limited challenge to the assumption that technology will help improve quality of life to be found in the literature. Potential negative impacts and the influence of cultural values a the project's context are either given superficial consideration or

none at all (Donner et al. 2008; Heeks 2002; Heeks 2009; Unwin 2009; Warschauer 2003).

2.4.2 Common key drivers

The Millennium Development Goals (MDGs) were key drivers for early *technology focussed* ICT4D projects along with goals relating to addressing issues of the 'bottom of the pyramid', that is, the three billion people living on an average of less than US$2 per day. Relevant goals include addressing issues relating to poverty, health, education and gender equality.

Recent motivations for *technology focussed* ICT4D projects include a combination of the earlier motivations identified by Heeks', such as organisational efficiency and modernisation, as well as the potential profit to be gained from a largely untapped market. A service that could be useful for emerging markets could potentially be very lucrative (Kuriyan, Ray & Toyama 2008).

2.4.3 Community involvement and evaluation methods

The majority of papers from *technology focussed* ICT4D projects are descriptive case studies that outline what was done with little information on the design process and social impact (Maail 2011; Unwin 2009).

The role of the community in *technology focussed* ICT4D projects is predominantly as passive recipients of the technology or service with little or no involvement in the choice of the solution or implementation process. In addition, there may be unquestioned assumptions from the technology providers' perspectives that technology providers 'know best' and perhaps also know best what will work.

2.4.4 Case study examples

Technology focused ICT4D approaches were the most common in early ICT4D projects, however, recently they are likely to share at least some common characteristics as *generic design research* ICT4D projects. Wertlen (2008) provides a helpful and brief review of a number of *technology focussed* ICT4D projects. Two of the most notable examples are the One Laptop per Child initiative and the Hole-in-the-Wall project.

Case study 1: One Laptop per Child

The One Laptop per Child (OLPC) initiative, also known as the $100 laptop project, is one of the most well-known ICT4D projects. The initiative was unveiled at the World Economic Forum in January 2005 by Nicholas Negroponte, a former director of MIT Media Lab, and is still continuing twelve years later at the time of submission in 2017. The OLPC's intention was to revolutionise education for children in developing countries by providing each child with their own low-cost, durable laptop, thereby providing the means for the children to teach themselves and each other ('One Laptop per Child' 2011). OLPC is categorised as a *technology focussed* ICT4D initiative because of the lack of involvement in the design and implementation process of the people it was designed for. OLPC supplied and promoted the use of the OLPC laptops without the involvement of communities that would use the laptops and without investing resources into understanding the various cultural contexts it would be used in (Leaning 2010).

The first laptop created was called the XO and was intended to sell at a purchase price of $100. It was a technology-centric, top-down driven project that received strong support from industry and leaders in developing countries. To date however, it has not lived up to the expectations it created. These ranged from the purchase price, which was $199 as of 2011, to the number of laptops deployed. A few hundred thousand were deployed as of June 2009 in contrast to the estimate of 150 million annual deployments by the end of 2007 (Kraemer, Dedrick & Sharma 2009). As of 2016, the number of deployments was still below 2.5 million (Ames 2016).

While the OLPC represented a technical success and contributed to revolutionising the Personal Computer (PC) market, the apparent focus on technical and hardware aspects of the project may have contributed to OLPC underestimating the impact of social, political and cultural factors. In their review of OLPC in 2009, Kraemer, Dedrick and Sharma found that initial enthusiasm and promises of significant orders of OLPC products by leaders in developing countries were either not followed through with in reality, or were significantly reduced compared to the earlier promises made. Reasons for the cancellation or reduction

in orders included the increased price, but were primarily due to social and political complexities that were not accounted for (Kraemer, Dedrick & Sharma 2009). For those orders and projects that did go ahead, issues included lack of ongoing training and support that compromised the longer-term sustainability of its use (Ibid).

Another unintended consequence of the OLPC, which has affected its impact, is the aggressive response from the PC industry which focussed on lowering the cost of PCs and producing netbooks - small, less powerful computers that are similarly priced to the XO (Bender et al. 2012). The similar cost of netbooks to the XO has placed netbooks in competition with the XO.

Unintended uses and consequences are common in technology innovation (Orlikowski 2008) and can have both positive and negative consequences. While the aggressive response from the PC industry to lower the price of laptops hindered the potential adoption of the XO, it is also possible that the lower PC prices contributed to a greater number of people having access to a computer in a much shorter timeframe than would have been the case without the OLPC initiative.

Case study 2: Hole-in-the-Wall

The Hole-in-the-Wall project was an experiment initiated by the government of New Delhi in collaboration with an industry partner. The purpose of this project was to provide computer and internet access to the city's street children and explore the concept of minimally invasive education. A five-station computer kiosk was set up in a slum in New Delhi with minimal support, instruction and guidance.

The project was initially considered a success with kiosks proving to be very popular with children, and children learning basic computer skills without formal guidance (Mitra 2003). However, more recently, there are divided opinions on whether it would still be considered a success and how sustainable it is as an initiative (e.g. Arora 2010). Even though children's ability to pick up basic computer literacy skills without guidance supported the idea of using these kiosks for minimally invasive education (Mitra et al. 2005), further investigation revealed

that the internet was of little use as it seldom worked, no programs were made available in Hindi, (often the only language spoken by the children), and most of the children's time was spent using paint programs and computer games (Warschauer 2003). Parents of the children also had mixed feelings about the experiment, with some parents expressing concern that their child was losing focus and interest in school as a result of the kiosks and feeling that minimally invasive education was also minimally effective (Ibid.). The Hole-in-the-Wall project highlights the complexities of measuring and reporting success, as well as the challenges with evaluating ICT4D initiatives, which are necessarily multi-dimensional in their complexity.

2.5 Generic design research approaches

The large number of failures experienced in early *technology focussed* projects served as a catalyst for some to explore collaboration opportunities with people who could investigate how factors other than technology and infrastructure could contribute to a technology intervention's success (Heeks 2009; Unwin 2009; Warschauer 2003). For example, the recognition of the value HCI could contribute to the ICT4D context lead to more projects seeking collaboration with the HCI community.

One of the primary features of this new wave of ICT4D projects was the recognition that factors beyond technology and infrastructure will influence an interventions success. A significant example includes the importance of understanding the context that the ICT will be used in any ICT4D initiative. Another example is the importance of involving and getting the input of the people that will (or could potentially) use the technology in the design and implementation stage of a project. The combination of the growing number of projects investigating factors beyond technology and infrastructure, as well as the recognition of the unique challenges and the expertise required to address them, provided a major impetus for the formal recognition of ICT4D as a field.

The involvement of community (that is, those who will use the technology, or the technology is intended for) is recognised as important in ICT4D projects applying

generic design research methods. However, what sets these projects apart from projects applying *culturally tailored* methods is the lack of explicit consideration or critique of the cultural appropriateness or relevance of the engagement methods used throughout a project.

A brief description of the dominant discipline and philosophy; common key drivers; as well as involvement of community and evaluation approaches for applying generic design research approaches to ICT4D are detailed below. Two case studies, Cell Life and designing with mobile digital storytelling in rural Africa are introduced and described.

2.5.1 Dominant discipline and philosophy

Dominant disciplines that apply *generic design methods* in ICT4D projects are Computer Science, Information Systems and Development Studies. Of these, Computer Science is the dominant discipline involved in ICT4D technology interventions, whereas Information Systems and Development Studies projects tend to focus more on understanding impact or developing frameworks.

The driving belief in this approach is that understanding the context of use and involving people that will (or could) use the ICT is important for the success and sustainability of an initiative. People involved in projects that apply generic design methods to understand a context are also more likely to subscribe to the belief that people have the right to have a voice in projects that will impact them (e.g. Chetty, Tucker & Blake 2004; Sharma 2015; Taylor et al. 2017).

2.5.2 Common key drivers

Key drivers for ICT4D projects applying generic approaches are similar to those of technology focussed ICT4D projects. However, the potential of ICTs to contribute to growth and development in general is also a major driver. Key catalysts for this approach include the high failure rate of ICT4D projects and the massive growth in access to mobile technologies in emerging economies over the past decade.

ICT4D projects applying *generic design research* methods usually have one of the following primary drivers:

1. The intention to design, build or adapt an ICT intervention, or
2. The intention to understand how an ICT is or could be used.

In the event that both drivers exist in a project, there is still usually only one that is dominant (Warschauer 2003).

2.5.3 Community involvement and evaluation methods

The evaluation of ICT4D projects applying generic design research methods remains relatively limited and difficult to categorise due to unclear descriptions of evaluation processes (Chepken et al. 2012) particularly for ICT interventions. Evaluations of ICT interventions that can be categorised typically focus on deployment success, followed by academic success (Ibid).

I found no comprehensive reviews of evaluation approaches and methods used in ICT4D projects that focus on understanding how ICTs are or can be used. However, Chepken et al. (2012) explore the evaluation approaches of technology interventions within the context of ICT4D according to an evaluation framework put together by Wynekoop & Conger (1990) and used by Kjeldskov & Graham (2003). Their framework categorised research that was:

a) Conducted in a natural setting and applied the case study, field study or action research method,
b) Research conducted in an artificial setting that applied a laboratory experiment method, and
c) Research conducted in an environment independent method that applied survey, applied or basic research as well as normative writings.

In addition to, and perhaps contributing to a lack of reviews of evaluation approaches, there are also relatively few comprehensive accounts of evaluation in the literature and a standard for reporting evaluation has yet to be developed (Burrell & Toyama 2009; Taylor et al. 2016; Unwin 2009).

2.5.4 Case study examples

Two case studies described below illustrate examples of ICT4D projects that apply generic design research methods. These include: 1) the Cell Life initiative in South Africa which explores how mobile phones can be used to support patient management of HIV / AIDS (de Tolly & Alexander 2009; Cell-Life 2011); and 2) the work done by Bidwell & Reitmaier et al. (2010) regarding the use of mobile phones for recording and sharing local stories.

Case Study 3: Cell-Life

Cell-Life is an initiative that explores ways in which mobile phones can be used for the management of HIV/AIDS through patient monitoring and communication of relevant data, counselling and other services related to the treatment and management of HIV/AIDS ('Cell-Life' 2011). Cell-Life began as a research project at the University of Cape Town, South Africa in 2001. It has now spun off into a not-for-profit organisation that works in partnership with over 50 organisations ('Cell-Life' 2011). Cell-Life focuses on using readily available and widely accessible features on mobile phones to share and provide content relating to HIV/AIDS. For example an instant messaging service widely used in South Africa called MXit and WAP is used for SMS messaging ('Cell-Life' 2011).

Cell-Life has a strong dual focus on the context which the service is designed to be used in, as well as developing appropriate technological solutions for this context. The design and evaluation of the project drew from traditional western-derived methods and preliminary reporting of the design and early evaluation findings can be found in a paper by de Tolly and Alexander (2009).

An innovation to come out of Cell-Life is to use missed calls to send information requested. That is, a person wanting information will dial a certain number and let it ring. No one answers the call, but the call is registered by a computer, which can then send an SMS to the number with the associated information (Marsden 2008).

The success of Cell-Life is difficult to assess due to the lack of rigorous evaluation. However, anecdotal evidence, for example positive comments reported by team

members and awards won, indicates that it is experiencing at least some measure of success. The Cell-Life initiative continues to expand and it has received numerous awards over the past five years ('Cell-Life' 2016). Cell-Life also serves as an example of a project that is investing efforts into understanding the context in which it will be used to provide appropriate technological solutions. The limited systematic evaluation of Cell-Life, however, is a weakness in this project and makes it difficult to derive tangible learnings from this experience that can be applied to other projects.

Case Study 4: Designing with mobile digital storytelling in rural Africa

This case study reports on the design, evaluation and subsequent iteration of a Mobile Digital Storytelling system initially designed by Thomas Reitmaier at the University of Cape Town ICT4D group. The project serves as an example of an ICT4D initiative that initially applied generic design research methods, as described in early papers such as Reitmaier and Marsden (2009), however later stages of the project and iterations evolved towards culturally tailored ICT4D, as described in later papers such as Reitmaier, Bidwell and Marsden (2011).

The Mobile Digital Storytelling system began with the idea of using principles of Interaction Design to develop a Mobile Digital Storytelling system including understanding user needs, developing prototypes and conducting user evaluations (Reitmaier & Marsden 2009). User needs and user evaluations were carried out using university students for practical purposes and the design was refined over four prototype cycles. An experiment was conducted, again with university students, which assessed task completion time against a Mobile Multimedia Presentation Editor and reported positive findings (Jokela, Lehikoinen & Korhonen 2008).

The Mobile Digital Storytelling system was then taken to a rural village in the Eastern Cape of South Africa, which is one of the homelands of the amaXhosa (Xhosa people) and one of the contexts that it was originally designed for. The aim was to enable people who did not own computers the ability to record their stories on their mobile phones. Two workshops were then conducted with six rural

community participants to assess the usability of the Mobile Digital Storytelling system. Community participants were recruited through a local non-profit organisation in an area that one of the two researchers had previously spent time developing relationships. In the first workshop, participants were given an overview of the project and taught how to record. They practiced taking photos and recording during the workshop and then left for the afternoon with the project phones. Before leaving, participants were told they should take as many photos as they liked and incorporate them into stories as they liked. They formed pairs based on friendship and had 23 hours before the next workshop to take photos and record stories. The second was an educational workshop teaching the participants how to create and assemble their stories on the mobile phones provided by the team. The participants discussed the photos they had taken and stories they had recorded the previous day and some of the problems they encountered.

Most participants recorded stories that contained and focussed on people in natural settings, for example in their homes, gardens or fields. They also included a wide range of other subject material such as animals and children role-playing. Aside from usability issues identified, there were two key findings from the workshops with community participants. The first was the realisation that the initial concept was profoundly localised in Western storytelling with a much greater focus on visual elements than what the amaXhosa community participants wanted or needed. The Mobile Digital Storytelling system was designed to be able to attach photos to every few seconds of audio recording. However, community participants preferred fewer photos and longer narratives. This is in-line with the oral tradition of the amaXhosa which focuses on narrative. The second realisation was the unexpected greater potential for the Mobile Digital Storytelling system to be used as a cultural probe[2] rather than a system that would be used to record rural amaXhosa stories (Bidwell & Reitmaier et al. 2010).

[2] Cultural probes are a non-invasive tool to get insight into peoples lives (Gaver, Dunne & Pacent 1999). Common examples of cultural probes include diary studies and disposable cameras.

The Mobile Digital Storytelling system serves as an example that set out with a certain intention and achieved something related but different. That is, it set out to design a mobile digital storytelling application to share stories, but the most powerful use of the application was as a cultural probe. In these early stages, the project also serves as an example of a project that intended to tailor the technology to a cultural context, but the design research methods were not necessarily tailored. However, findings from research with community participants reported by Bidwell & Reitmaier et al. (2010), were a catalyst for the project pivoting from a mobile digital storytelling project to capture local stories of the amaXhosa to the investigation of the mobile digital storytelling application as a cultural probe. The later investigation of use and subsequent iteration of the Mobile Digital Storytelling system as a cultural probe in another African context, reported by Reitmaier, Bidwell and Marsden (2012), contains elements of culturally tailored approaches, which are discussed next in Section 2.6.

2.6 Culturally tailored approaches

Culturally tailored is a term commonly used in medical literature to describe the tailoring of an intervention or tailoring the communication of a medical intervention to the patient's cultural context aiming to improve health outcomes, (e.g. Archibald 2011; Peek et al. 2012). A comprehensive account of culturally tailoring in medicine can be found in Resnicow, Braithwaite & Glanz (2002). I have borrowed *culturally tailored* from the medical literature due to the overlap in the intention of its use to describe design approaches and methods that have been chosen and/or developed to fit them to the local context. In ICT4D projects, the differentiation between *culturally tailored* methods and *generic design research* methods stems from *how* an understanding of context is established and the involvement of and commitment to the people that will (or could) use the ICT is approached.

Other terms used in ICT4D research and practice include *culturally appropriate* or *culturally sensitive*. Although the meaning is similar, the key difference in using a *culturally tailored* approach is that there is no judgement of whether a proposed

method or approach is in reality appropriate or sensitive. Rather, it signifies that an attempt has been made to craft the approach to make it appropriate for the context in which it was applied. Another term that could be conflated with culturally tailored is *cross-cultural* design. What distinguishes *culturally tailored* from *cross-cultural* is that design does not necessarily need to involve designing across two or more cultures.

Although the use of *generic design research* methods in ICT4D is currently the dominant approach, using *culturally tailored* methods is gaining momentum and increased visibility. Examples of projects that use *culturally tailored* approaches or methods in ICT4D include Chavan (2005), Light et al. (2010), Irani et al. (2010), Iseke (2011), Medhi & Toyama (2007), Winschiers-Theophilus (2009) and Zulaikha (2014). It is difficult to say how much the current under-representation in the literature of projects applying *culturally tailored* methods is due to the small number of projects tailoring their methods for the cultural context, the lack of consensus in the ICT4D community about how to describe the approach, or for other reasons. It is also interesting to note that there are strong examples of innovative approaches to engaging communities that are under-cited relative to their potential contribution to the field. Two examples of this, the Bollywood technique (Chavan 2005) and enacted personas (Light et al. 2010), are discussed as case studies later in this section.

A number of possible reasons, adapted from Gitau, Plantinga and Diga (2010), for the lack of culturally tailored ICT4D publications include:

- *A lack of prioritisation by researchers to publish* (over practical project contributions). Researchers taking this approach may place greater significance on relationship building, ethics and sustainability to the sacrifice of publications.
- *Lack of flexibility of conference and journal publishing criteria* that do not necessarily support or value this alternate research approach or alternate format that better supports the research. This is particularly problematic for research that does not naturally or comfortably fit into a standard scientific

paper format, for example, aim, method, findings, conclusion and discussion.

Initiatives such as the Indigenous Knowledge and Technology Conference in 2011 (IKTC2011) and the introduction of Open Sessions to the ICTD conference since 2012 have attempted to have more inclusive submission criteria. For example, the IKTC 2011 conference and the Open Sessions at ICTD accepted different types of submission formats such as audio files and videos. These were attempts to be more inclusive and to support multiple voices in this area, particularly those from emerging economies, to have a voice in a format that better suits their approach to sharing knowledge and ideas. However, despite some attempts to have more inclusive submission criteria, conference and journal publication criteria remains a significant potential barrier. Enabling various ways of participating in the dialogue about ICT4D is incredibly important, especially in academic circles where publication is still the major metric to measure research impact. Beyond the significance in academia, publication also provides a level of visibility that is challenging to achieve within the broader ICT4D community.

- *Challenges associated with researchers who are ESL* (English Second+ Language) submitting conference and journal papers in English. The majority of international conferences require submissions in English. English may be the second, third, fourth, fifth + language for local researchers applying culturally tailored methods to projects in their own communities. This puts them at a disadvantage when putting together submissions in English or may be a deterrent to submitting anything.
- *Lack of acknowledgement by the ICT4D community of the significant contribution this approach can offer.* This is reflected in both the lack of publications and the lack of citations of the few studies that do take alternate approaches.
- *Lack of awareness that alternate methodological approaches* and insights into doing cross-cultural research are of interest (this links with the previous point above).

- *The diverse range of disciplines* that researchers affiliate with limit exposure to, and awareness of, related work that is not published in familiar outlets.
- *Not all researchers working in the ICT4D space identify with ICT4D*, focussing instead on publication in their home discipline e.g. Sociology, Anthropology, Development Studies etc.
- *The cost of conference attendance*. Conferences are important for sharing and promoting work, networking, hearing about the latest research and identifying potential future collaborators, to name a few reasons. Attending conferences can be very expensive, often involving travel and accommodation costs on top of registration. Despite scholarships being offered in some conferences, the overall cost of conference attendance still represents a potential reason contributing to the under-representation of culturally tailored examples.

Applying a culturally tailored approach in an ICT4D project may also lead to a project significantly adjusting its direction away from technology solutions. For example, Ellya Zulaikha's work with rural craftspeople in Indonesia may have led to the creation of a website to sell glass beads had she taken a *technology focussed* approach. However, close consultation with rural craftspeople lead to the project aiming to help the craftspeople refine their craft with industrial design students to increase the local reputation, pride, awareness and therefore livelihoods (Zulaikha 2014). If an ICT4D project adjusts its focus away from technology, people may choose to publish in other areas. In addition to this, researchers working in the ICT4D area may have varying development agendas, which may lead them to prioritising publication in non-technology related areas, for example, International Development conferences and journals.

Whether it is projects' changing their focus away from technology, the publishing criteria, or low priority for publication within specific projects, the number of publications available does not seem to reflect the number of projects that use culturally tailored methods and approaches in the ICT4D space. This contributes to the case for an increased discussion within the ICT4D community on culturally tailored approaches.

A brief description of the dominant disciplines and philosophy; common key drivers; and community involvement and evaluation in *culturally tailored* approaches are detailed below along with two case studies that help illustrate this approach; Performed Personas (Light et al. 2010) and the Bollywood Technique (Chavan 2005).

2.6.1 Dominant philosophy

There are only a relatively small number of practitioners from a variety of different disciplines that fall in this category of *culturally tailored* ICT4D. This, in combination with the wide range of ways of currently describing culturally tailored ICT4D approaches, makes it difficult to establish if there is a dominant discipline. However, although it may be difficult to identify a dominant discipline, there are multiple values that appear to be shared and prioritised[3]. These include:

- An ethical commitment to *avoiding harm* to community members involved in the project,
- A *prioritisation of impact on the community* over other project priorities,
- A commitment to applying methods that are *meaningful for the cultural context*. This commitment can involve the adaptation of existing traditional methods and/or the creation of new methods and approaches,
- An attempt to foster meaningful *relationships* with community members,
- An attempt to provide community members with a meaningful *voice* in the project/initiative, and
- A commitment to community members *beyond the life* of the project/initiative.

[3] Note: These shared values are not exclusive to *culturally tailored* ICT4D and it is possible for one or even several of these values to be shared in *technology focussed* or *generic design research* ICT4D projects too.

2.6.2 Common key drivers

Common motivations in *culturally tailored* ICT4D are to explore culturally and socially relevant ways to work in partnership with communities to explore how ICTs can be useful. It may also involve educating communities on the possibilities that ICTs offer so that they can champion and drive their own ICT projects and initiatives. Whatever the primary objective is, *culturally tailored* ICT4D projects aim to enable communities to have meaningful voices through adapting or creating methods for the communities' cultural context.

2.6.3 Community involvement and evaluation methods

Culturally tailored ICT4D projects are by definition bespoke projects. Approaches, evaluation methods and the nature of how a community may be involved vary across different projects. Evaluation approaches and methods can include anything from the adaptation of Western approaches for non-Western contexts (e.g. Light et al. 2010; Soro et al. 2016) to the use of methods specifically designed for the context (e.g. Chavan 2005; Chavan 2009; Iseke 2011; Kapuire, Winschiers-Theophilus & Brereton 2017). The thread that connects *culturally tailored* ICT4D projects is the explicit consideration of the appropriateness of the approach and/or method, and the potential for tailoring the approach and/or method for the context where these are applied

2.6.4 Case study examples

For the purpose of illustrating this approach in more detail, two examples that illustrate the use of *culturally tailored* approaches or methods in ICT4D projects are described. These include the use of performed personas as a tool to facilitate cross-cultural collaboration by Ann Light and the creation of the Bollywood technique method to encourage critique of technology projects from Indian participants by Apala Chavan. These case studies are described below.

Case Study 5: Performed personas

The use of a performed persona as a tool for cross-cultural collaboration is described by Light et al. (2010) in the paper 'Performing Charlotte: A Technique to Bridge Cultures in Participatory Design'. The introduction of personas into HCI

and related research is usually attributed to Cooper (2004), who defines them as follows:

> *"Personas are not real people, but they represent them throughout the design process. They are hypothetical archetypes of actual users. Although they are imaginary, they are defined with significant rigor and precision. Actually, we don't so much "make up" our personas as discover them as a byproduct of the investigation process. We do, however, make up their names and personal details." (Cooper 2004, p. 85)*

Light et al.'s project aimed to explore how tracing technology could be used to trace the supply chain of ethical goods from producer to consumer in different global contexts as part of the Fair Tracing (www.fairtracing.org) project. Specifically, the research investigated the supply of Chilean wine to British consumers. The project was funded for a period of three years to research both the building of the tool itself, as well as understanding the potential for its use. The Fair Tracing project began by understanding the British market and their needs. This was primarily achieved through surveys and interviews. The researchers then sought to understand the Chilean winemaking process from the Chilean perspective using interviews conducted in Chile. The third step in the process was to communicate the British market and consumer needs to the Chilean winemakers with the plan to hold participatory workshops to explore the purpose and function of the tool as well as manage expectations.

The focus of this case study is on the use of performed personas to engage Chilean winemakers in a contextually relevant way in this third step of the process. The original plan for this part of the project was for the project team to share the market research about British consumers with Chilean winemakers through three personas developed as quick descriptive sketches. The team wanted to avoid stifling ideas by lecturing to the Chilean winemakers about the UK market. However, after interviewing many of the Chilean staff before the first design workshop, the researchers felt that the information 'felt insubstantial and dry in

their textual incarnation' (Light et al. 2010). The researchers realised that the personas could add more value to the project if they were dynamic, fun and responsive to the groups' needs. The researchers also recognised that cultural-historical differences may be more significant than language barriers alone for wine producers in an emerging Latin American economy trying to understand the needs of consumers in Britain, a wealthy, industrialised country. Recognising these factors, the researchers decided that it might be more helpful to enact or animate the personas in a design workshop. The team decided they would animate only one persona but included the other two as people related to the first persona. The first persona, Charlotte, (who represented the most common type of consumer) was the mother of persona two, whose partner was persona three.

During the design workshop, one of the researchers enacted Charlotte and was able to refer to the other two personas in the context of her newly established relationship with them. She was only able to speak in English, so interacted with the wine production stakeholders through a Spanish interpreter. To make it clear when she was in persona mode versus researcher mode, she used glasses and held a wineglass as a cue for when she was Charlotte, the persona. The glasses and wineglass props enabled the researcher to have the dual role of researcher and persona in the workshop. The authors found enacting Charlotte helpful in communicating the needs of the British consumer market to the winemakers who found it highly engaging. Animating Charlotte gave both the research team and winemakers a different perspective from which to reflect on the problem context that enhanced empathy on both sides. The workshop participants could refer to Charlotte when questions arose about the usefulness of data to a consumer. In addition, the performed persona was a useful workshop facilitation tool. For example, if everyone started talking at the same time, Charlotte would ask a question in English, causing a 'helpful pause' in the conversation as her question would need to be translated.

Performed personas are an example of a culturally tailored method as the researchers were mindful of the effects of cultural differences between the people on the project and adapted their method during the research project accordingly.

On reflection, the researchers found the tool very helpful, highly engaging and a useful design tool for the context. The limitations they identified included potentially placing undue weight and significance on Charlotte's opinion and the confidence required to perform the persona. However, overall, they reported experiencing significant value by using this culturally tailored method for this project.

Case Study 6: Bollywood style evaluation

Bollywood style evaluation is an example of a culturally tailored method that was created for doing research in an Indian cultural context. In order to encourage critical feedback on technology applications, Apala Chavan pioneered the Bollywood style evaluation (Chavan 2005), also referred to as 'Bollywood Method' (e.g. Chavan et al. 2009). Chavan recognised that Indian users were reluctant to provide critical feedback in technology projects and attributed this reluctance to three main cultural reasons.

- The first was the Indian culture advocating an acceptance of the state of any given situation and attitude of working around issues, rather than addressing them directly,
- The second was the Indian collectivist culture that made it difficult for an 'individual' to feel empowered to give their own opinion, and
- The third was that many Indians did not feel comfortable in the spotlight, and the experience reminded them of an examination.

So an Indian person may find it difficult to critique a product, and would say that every product is good and attribute any issues they have as their own problem. However, a cultural exception to providing critical feedback is when watching Bollywood (Bombay + Hollywood) films. In India, not only Bollywood films are popular, film reviews are popular as well and an acceptable format for criticism. This inspired a Bollywood style set of scenarios to extract critical feedback on the user interface of websites by creating an environment where Indian participants would feel more comfortable providing critical feedback. The use of the Bollywood style evaluation was compared to conventional usability evaluation methods in a

within-subject study. In a within-subject study, participants are exposed to every study variable to assess the effect of the variable (Vogt & Johnson 2011). In this study, the variable studied was the effect of the use of the Bollywood style evaluation versus traditional usability evaluation methods on participants' responses. Chavan found that when traditional usability evaluation methods were used, participants said the website was good and that nothing needed to be changed. However, when the Bollywood style evaluation was used, participants were forthcoming with their critique and many even offered design solutions. The evaluation of the use of the Bollywood style indicates that it may be a more effective way of understanding the usability of a product, that is, when the method was culturally tailored versus the use of traditional usability studies.

2.7 Summary of three approaches

The categorisation of ICT4D approaches and methods into *technology focussed* approaches, *generic design research* approaches and *culturally tailored* approaches enabled me to position my research in the ICT4D literature. It is important to reiterate that the three approaches are not mutually exclusive, and it is possible for projects to have elements of more than one approach. Likewise, the attributes described do not belong exclusively to any one approach. For example, an ethical commitment to avoiding harm is a common shared value in culturally tailored ICT4D, however, this does not mean that some technology focussed or generic design research driven ICT4D projects may not consider how they can avoid doing harm to community members. Table 3 below outlines the key attributes of the three approaches.

Table 3 Summary of ICT4D approaches

Approach	Technology focussed	Generic design research	Culturally tailored
Key characteristic	Prioritise the creation or training of people to use technology and/or setting up technology-related infrastructure.	Perceive understanding the social and cultural context and/ or the engagement of community members in a project as contributing to project success.	Perceive understanding the social and cultural context in addition to the engagement of community members in a project as contributing to project success.
	May not involve communities in the design or implementation of solutions.	Use generic design research methods to understand and/or engage communities.	Adapt or create design research methods to understand cultural context and engage communities.
Dominant disciplines	Computer Science, Informatics and Development Studies	Computer Science, Information Systems, Development Studies.	Dominant disciplines yet to be determined.
Common key drivers	1) Organisational efficiency; 2) Modernisation; and/or 3) Potential profit.	1) Design, build or adapt an ICT intervention; and/or 2) Understand how an ICT is, or could be used.	Work in partnership with communities to identify how ICTs can contribute in a culturally and socially relevant way.
Approach to methods	May or may not use design research methods in a project.	*Apply* design research methods to project context that have primarily been developed in a Western context for use in a Western context.	*Adapt* existing design research methods or create new design research methods for the project's social and cultural context.
Community involvement	*Passive recipients* of technology or service, with little or no involvement in choice of solution or implementation process.	Engaged in at least some stage of the project using *generic design research methods* to influence the solution and/or implementation process.	Engaged in at least some stage of the project using *culturally tailored methods* to influence the solution and/or implementation process.
Key case study examples	One Laptop per Child (OLPC), Hole in the Wall	Cell-Life, Mobile digital storytelling	Performed personas, Bollywood style evaluation

The three approaches contribute to the dialogue on developing a methodological framework and common language for discussing approaches and methods in ICT4D projects. It can be tempting for ICT4D project teams to get caught up in details relating to the technology or service they are working on, particularly if they are using *technology focussed* approaches and methods. Getting caught up in the details can easily result in losing sight of the common high-level motivator for many ICT4D projects, that is, improving lives in communities. It may also result in the potential negative impact of a project on communities not explicitly acknowledged.

Using *generic design research* approaches and methods, many which can be found in the HCI field, is useful for increasing the chances of a project being successful, both technically and for the communities involved. However, these methods may not always be as inclusive of communities as the project team intend, especially where cultural factors may influence the appropriateness and effectiveness of a method.

Using *culturally tailored* approaches and methods has the *potential* to contribute to meaningful participation and thereby increase the chances of more useful, successful and relevant project outcomes. However, literature supporting the extent to which this is the case, and the potential disadvantages of using culturally tailored approaches is limited. This research aims to partly address this gap by contributing a case study of a culturally tailored ICT4D project and reflecting on the benefits and pitfalls of applying a culturally tailored approach. The research journey and methodology used are discussed next in Chapter 3.

3

Methodology and Research Journey

In the spirit of participatory action research, there have been two major shifts of direction in the research that this thesis is based on. This chapter is an account of my research journey and is divided into two parts.

Part one describes the research methodology, beginning with an overview of participatory approaches. This is followed by a description of the action research cycle framework used. These form the philosophical and theoretical foundations of my research.

Part two is an account of the research journey itself. It begins with a description of the scoping phase. Next, the subsequent three research cycles are outlined, including the aims, research questions and overview of key activities for each cycle of research.

Part One: Methodology

Participatory action research and participatory design provided the methodological foundations for my research. Both recognise the importance of investing time in building relationships as well as in enabling and supporting inclusive participation in design research and practice. An introduction to participatory approaches forms the first part of this chapter. This is followed by an introduction to participatory action research and an explanation of why it was chosen as the methodological framework for my research, its philosophical and theoretical foundations identified and limitations explored.

3.1 Participatory approaches

Central to action research is the idea that researchers and research can and should be used as agents of transformation, affecting positive change in the research context where there is opportunity (Swantz 2008). Action research often begins with researchers or members of a project team asking themselves how they can improve a situation (Reason and Bradbury 2006). That is, rather than treating a research context as purely a data gathering opportunity or 'living lab' environment where variables are introduced and their effect assessed, researchers actively look for opportunities where they can use the understanding they develop in their research to improve the lives of people they are working with. Participatory action research emphasises that research participants should be included as active participants in the research process or solution design. Grant, Nelson and Mitchell (2007) provide a definition that captures this sentiment in their chapter in the Sage Handbook of Action Research as follows:

> *"Participatory Action Research (PAR) is a research methodology that attempts to address power imbalances and oppressive social structures. It values the 'researched' community as a vital part of the research project and its members as experts of their own experiences. PAR is particularly concerned with oppressed communities and attempts to create action as a catalyst for social change." –Grant, Nelson and Mitchell (2007, p589)*

On the other hand, the core of participatory design is participation (Robertson & Simonsen 2013). Participatory design recognises that genuine participation by potential users of new technologies in the design process improves the overall quality and success of design. Most importantly, it is a central commitment of participatory design that potential users of new technologies should, as a matter of principal, have the right to be part of designing tools that they will use (Ibid).

In the opening chapter of their Handbook of Participatory Design, Robertson and Simonsen (2013) define participatory design as:

> *"a process of investigating, understanding, reflecting upon, establishing, developing, and supporting mutual learning between multiple participants in collective 'reflection-in-action'.*
>
> *The participants typically undertake the two principal roles of users and designers where the designers strive to learn the realities of the users' situation while the users strive to articulate their desired aims and learn appropriate technological means to obtain them." – Robertson and Simonsen 2013, p. 2*

Participatory design has been strongly influenced by action research (Bannon & Ehn 2013), which accounts for the significant overlap between participatory design (PD) and participatory action research (PAR). For example, the empowerment of participants by active engagement in the design process is central to both.

To enable relevant and meaningful design, there are a number of design principles, foundational to both PAR and PD that can support both end users (or community members) having a meaningful say in what they use and how they use it, and technology designers having the understanding they need in order to be able to design / co-design relevant and meaningful solutions. These concepts can be applied in ICT4D research and are summarised below in sections 3.1.1 to 3.1.4. These include immersive research, relationship building, mutual learning, consideration of ethical impact on research subjects and sustainability.

3.1.1 Immersive research

Both PAR and PD emphasise the importance of understanding the context in which a design solution will be applied. Immersive research refers to working with people directly in their community, workplace or homes, rather than creating solutions purely in artificial lab situations or removed from the context in which they will be used (Kensing & Greenbaum 2013, p. 33). Immersive research does not mean literally designing and developing everything within the context of use. But it recognises that all action is situated and that the meaning of any action is determined by its context (Suchman 1987). Immersion in the research context is considered critical to developing contextually relevant and appropriate solutions. Immersion is especially important in ICT4D projects where the impact of environmental, social and cultural factors may be difficult for researchers to be aware of, or understand, if they have not spent significant time in the community or are unfamiliar with the cultural context. Commitments to relationship building, mutual learning and the consideration of ethical impact on research subjects underlie the value of immersive research (e.g. Robertson & Wagner 2013)

3.1.2 Building relationships in a project (action and philosophy)

A key component of PAR and PD is the acknowledgment of the importance and significance of relationships for a project's success. This attention to building and maintaining relationships is in addition to the active engagement of research participants throughout a project. Building and maintaining relationships contributes to meaningful design in a number of ways:

- **Developing trust** – Trust is particularly important in an ICT4D context, where members of a community may be reluctant to engage with researchers. For example, Marja-Liisa Swantz, an early pioneer of participatory action research in Tanzania, reflected that it was only when mutual trust was established that problems could be discussed openly (Swantz 1986). Trust among project participants is the foundation needed in order to access authentic information that may be critical to a project's success and enable access to other community members or potential project

participants. The process of establishing trust is often time consuming, so it can be useful for this time to be factored into project timelines.

- **Enabling access to participants** – Sometimes research with communities requires establishing trust and building relationships with gatekeepers first. Within a technology project in an organisation, the gatekeeper may be an employee or person in management. For example, in an ICT4D project in some rural villages in South Africa, access to participants could involve seeking permission from the village headman or a similar tribal authority (e.g. Bidwell et al. 2010). To neglect to seek permission from organisational or community gatekeepers can lead to antagonistic relationships in the project that can contribute to the overall failure of a project regardless of how successful a technology is on its own. Access to the right participants is necessary for not only developing an understanding of the context, but for co-design, ideation and concept testing sessions.

- **Enabling access to authentic information** – If a project member or team have established relationships with participants, they are more likely to access authentic information and interpret the information they acquire correctly. There are two major reasons for this. One, participants may feel more comfortable disclosing not only more information, but also sensitive information that could be important for the project design and implementation strategy; and two, the researcher would be in a better position to interpret what is meant versus what is said if the two are not aligned. This is particularly important in ICT4D projects where cultural differences may result in a disconnection between these two representations, (e.g. Light et al. 2011; Kapuire, Winschiers-Theophilus & Brereton 2017).

- **Identifying and nurturing project champions** – Establishing relationships in a community can increase the chances of identifying potential project champions and nurturing these champions. A project champion is not always necessary, but can be particularly useful for large

and longitudinal projects. Project champions can contribute to the ongoing maintenance and sustainability of a project, be advocates for the use of a service or technology, contribute to a smoother implementation and help access other participants for co-design workshops, testing sessions and research.

3.1.3 Mutual learning (philosophy)

Mutual learning is particularly relevant in ICT4D projects where there can be an extensive gap between practitioners' understandings of a community's cultural context, needs and values, and community members' understandings of what is technologically available or possible to design. Practitioners may be the expert on technology or an area of services, but community members, or organisational staff, are experts on their everyday practices and local culture. A participatory approach requires the sharing of knowledge of what is possible from practitioners and an understanding of a community or workplace, its needs and values from community or workplace participants.

In both PAR and PD, mutual learning is a key component enabling genuine participation to take place in the design, development and implementation of an intervention (Bratteteig 1997; Robertson et al. 2014). These include technology, service, program implementations and more. Mutual learning activities can run throughout a project and different kinds of activities can be used in different stages. For example, ethnographic studies are common early in a project (e.g. Bjerknes & Bratteteig 1994; Bidwell & Reitmaier et al. 2010), while later stages might focus on design workshops where prototyping and enactment are used to envisage future technologies (e.g. Kensing & Greenbaum 2013). Early PD projects even included the development of textbooks and the provision of classes for project participants (Bjerknes & Bratteteig 1994; Bødker 1996).

3.1.4 Ethics and impact on research subjects (local accountability)

PAR and PD subscribe to the belief that people have the right to design their futures and seek ways of enabling genuine and meaningful participation (Robertson & Wagner 2013). Built into PAR and PD is the consideration of the

impact that research will have on research subjects. Ways that participants can experience a tangible benefit, other than the potential project benefit, are also sought where possible. Benefits can range from participants contributing to something that they have an interest in, to being provided with compensation or other incentives. This is particularly significant when the project's intended outcomes cannot be guaranteed.

As Dearden (2012) argued, in his review of a number of projects, 'See no evil?: ethics in an interventionist ICTD', there is a lack of discussion of research ethics in interventionist ICT4D projects where there is a novel technology intervention. This gap is highlighted by the lack of mention of ethics or impact on participants in Burrell and Toyama's paper, 'What Constitutes Good ICT4D Research' (2009).

Applying the level of reflection and importance on ethics and impact that is demonstrated in PAR and PD to an ICT4D context is a way to increase the chances of projects leaving some kind of positive impact on communities, even if the project itself fails. Ethical guidelines and the consideration of the benefit or impact a project will have on a community will also minimise the chances of causing unintentional harm to community members.

Table 4 lists questions provided by Robertson and Wagner (2013, p. 82) as a useful place for designers to start critically reflecting on their use of PD methods, tools and techniques. This list could be equally useful for ICT4D researchers and project teams to explicitly consider the impact of a project on participants and the nature of community members' involvement.

Table 4 Useful questions for ICT4D projects with communities

Questions
Do users actually have *decision power* ? If so, what kind?
Does a design method, tool or process recognise and encourage participants' *abilities to learn* ?
Does a design method, tool or process guide designers and researchers to analyse and develop their *interests and attitude towards participants* ?
Does a design method, tool or process include *participants' evaluations* not just of what is being designed but of the design process itself, including the opportunities for and process of participation
Does a design method, tool or process *deal with a justified loss or change of design focus* , for example when participants identify problems that require non-information technology solutions (while the process was initiated to design information technology)?

In addition to thinking about participants' rights, the final question outlined in Table 4 is useful for thinking about a project team's responses to various scenarios. This was particularly relevant to this research, where the goal shifted from designing of a mobile health application, to developing an educational play about the internet in response to an evolving understanding of the research context.

3.2 Participatory action research

The key differences between PD and PAR lie in their core motivation and the focus of their application. Design lies at the core of PD and its major focus has been the design and implementation of information technologies. A focus on change is at the core of PAR and its application broad, extending across programmes, policy and education, in addition to the design of information technologies.

The priority placed on creating a positive impact, which forms the foundation of this research, ultimately resulted in the design of an educational and engagement tool, rather than the design of a specific technology solution. The strong focus on change of PAR, combined with the value of the action research cycles framework, provided the research approach and direction to ground this research. For this reason PAR is the focus of the remainder of this methodology section.

3.3 Philosophical and theoretical foundations of PAR

The philosophical foundation of action research approaches, including PAR, is markedly different from the traditional scientific approach which has dominated the natural sciences and which is typically positivist or positivist inspired. That is, subscribing to the belief that an objective reality exists that is accessible through careful, systematic study (Keat & Urry 1975). This positivist inspiration leads to a focus on measurement and the collection of facts with as little disruption and researcher interference in the environment being studied as possible.

While this may be appropriate for certain research contexts, for example when trying to understand phenomena in the natural and physical sciences, this approach is questionable in an ICT4D context when doing research with communities where there are significant socioeconomic, educational, access and power differences between researchers and research participants.

The common philosophical foundation of action research approaches, including PAR, PD and ethnographic action research, generally rejects this positivist philosophy (Gustavsen 2006; Susman & Evered 1978). Rather, action research is based on a different philosophy and is commonly associated with interpretivism (Lau 1999). Interpretivism upholds the belief that as a researcher attempts to understand what they observe, their values, beliefs and *a priori* knowledge necessarily become part of this interpretive process.

Knowledge that is gathered using the action research approach does not aspire (nor lend itself) to being validated by terms and techniques of the natural sciences such as repeatability, reductionism and refutability. Rather, it is validated in different ways, for example by tangible outcomes that change or alleviate the original situation or problem. Examples of philosophical traditions with alternative, but complementary, philosophical foundations can be found in phenomenology, pragmatism, existentialism and hermeneutics.

3.4 Affecting positive change

A priority when adopting an action research approach is *affecting positive change* within a research environment. This means that pre-defined goals and objectives should ideally be flexible and may change throughout a project. In addition, an interpretivist viewpoint allows for researchers' active participation and intervention in the research environment, as those elements that positivists might aspire to screen from research are acknowledged and embraced as part of the research process (Baskerville 1999). While there are many forms and definitions of action research in the literature (including PAR), four distinguishable characteristics are common. Baskerville (1999 p.9) identifies these characteristics as:

1. An action and change orientation,
2. A problem focus,
3. An "organic" process involving systematic and sometimes iterative stages, and
4. Collaboration among participants.

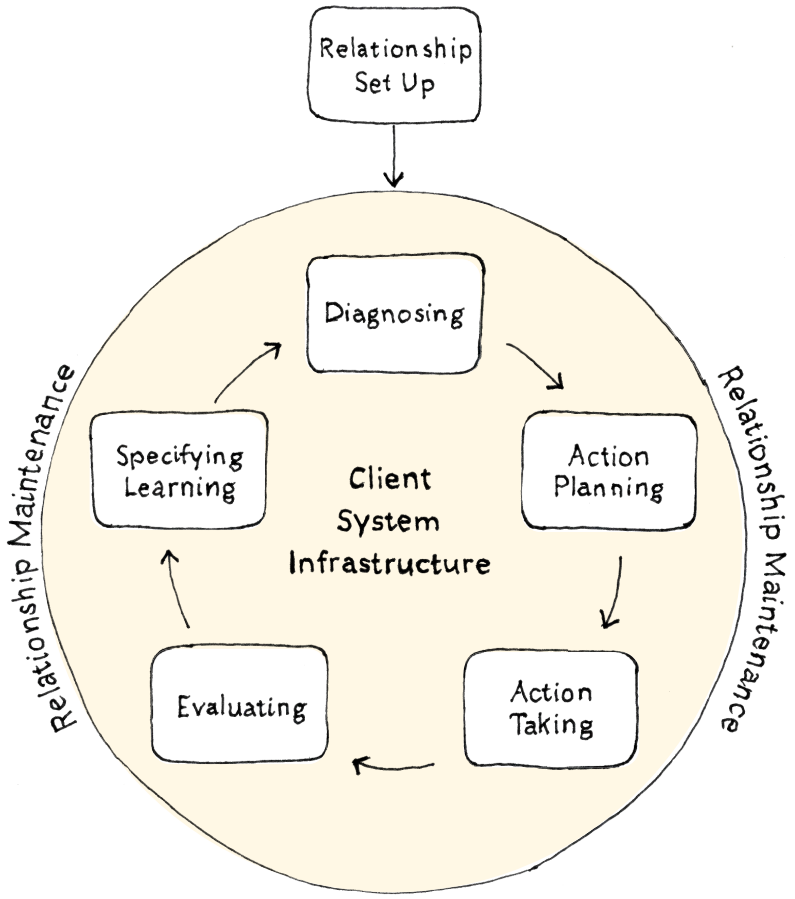
Additionally, action research is characterised by the active involvement of researchers and subjects/participants as co-participants affecting change in the research environment. Findings from an action research cycle can be applied immediately to promote positive change, and the researchers continue to attempt to link theories or ideas with the observed practice, including any changes in those practices throughout later research cycles.

3.4.1 The action research cycle

Figure 3 below illustrates Susman and Evered's commonly cited action research cycle, adapted for this project (Susman & Evered, 1978, p. 588). The five steps identified by Susman and Evered, (Diagnosing, Action planning, Action taking, Evaluating and Specifying learning), are supplemented with two additional steps for my research, Relationship set-up and Relationship maintenance. While relationship building and maintenance are implicit within Susman and Evered's

five original steps. I have made them explicit here to emphasise their importance in PAR, particularly within an ICT4D context.

Figure 3 Participatory action research cycle used in this research



The discussion of the original five steps below is based on Susman and Evered (1978). These five original steps operate within the client-system infrastructure, which is the traditional context within which action research is conducted. The research context includes the negotiated agreement between the researcher and the 'client' of goals, responsibilities and boundaries (Baskerville 1999). The ICT4D context also prioritises an understanding of the social, political and cultural context within which the project will take place.

The adapted action research cycle begins with a step labelled '**Relationship Set-Up**'. The 'Relationship Set-Up' step is necessary for entry into the action research cycle, within which the following five phases take place. This step replaces what is sometimes referred to in action research as 'negotiating entry to the client system

infrastructure' (Dick 2017). However, in my research, relationship set-up has been called out as an explicit, initial step of the action research cycle in recognition of the vital role that establishing relationships plays in ICT4D projects, as described by Dearden and Rizvi (2008). This critical step is where an action researcher and project team can assess their compatibility for a project and begin to explore potential roles. Mutual compatibility then provides the critical entry point into the action research cycle.

After identifying the '**Client-System Infrastructure**', that is the research context and environment, the action research cycle typically begins with '**Diagnosing**'. In this step, the problem(s) is/are identified that underlie the organisation's desire to change. It also involves developing a working hypothesis of the nature of the organisation and its problem area.

Moving clockwise, '**Diagnosing**' is followed by '**Action Planning**', which is a collaborative activity where the researcher and participants work together to establish a plan. It involves creating targets for change and planning how these can be achieved. A theoretical framework that informs the planning to achieve the desired state may guide this plan.

'**Action Taking**' involves implementing, or carrying out, the planned action. In this step, the researchers and participants engage in some kind of change related activity to achieve the desired goal. Following the change activity, the '**Evaluating**' step aims to assess whether the change activity achieved its theoretical effects, and how these effects influenced the problem. If the change was successful, this step must also assess the change activities contribution to the achievement of the desired goal. If the change was unsuccessful, this step involves identifying why this was the case, which then informs the next iteration of the action research cycle.

'**Specifying Learning**' is technically the fifth step in the action research cycle. However, it is typically an ongoing process throughout the whole cycle. This step involves what Argyris and Schon (1978) call "double-loop learning", which is the reflection on a process (i.e. learning about the process itself) to enable informed restructuring of organisational norms, or project make-up, to reflect the new

learnings. If the change is unsuccessful, the additional knowledge can contribute to the foundation for the next iteration of the action research cycle. Finally, regardless of the outcome of the change, findings can be used to inform the research community of learnings that can be applied to informing theoretical frameworks and how these are applied in future research settings.

'**Relationship Maintenance**' is the second addition made to the action research cycle for my research. 'Relationship Maintenance' is visualised as setting the boundaries within which a project will take place in recognition of the continued investment required to maintain and build relationships throughout a project. In an ICT4D context this represents the critical role that relationships play in ICT4D.

3.5 Limitations of PAR

Qualitative and quantitative research methods both share a range of benefits and limitations. Participatory action research is a qualitative research method and as such, is subject to the limitations associated with qualitative approaches. These include limitations of the researcher as a fundamental part of the data collection process, such as biases, inconsistency and data overload (Glesne 1999). In addition, the analysis and synthesis of qualitative data is more dependent on the skills and experience of the researcher, which contributes additional challenges during data analysis. The analysis of qualitative data can also be very time intensive and potentially overwhelming to the researcher.

As the researcher works closely with subjects and is actively involved in the change process, they may also face unique ethical challenges. For example, researchers may become so involved in the research environment and problem that they forget their obligations as a researcher to contribute theory and general knowledge. In addition, they may be faced with the challenge of being divided when deciding what to report, particularly if it involves a critical reflection on subjects with whom the researcher has worked closely and developed relationships with.

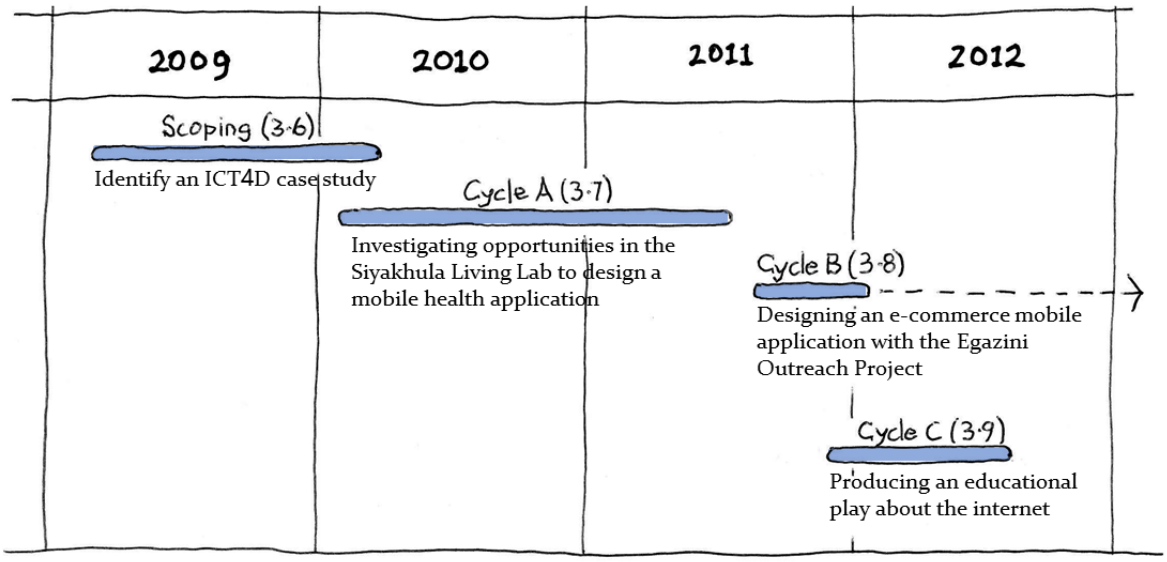
The iterative nature and action orientation of PAR can mean that it can be difficult for a researcher to know when to stop or want to stop (Dick 2002). In addition,

the expectation of the evolution of research can make projects difficult to plan and require significant flexibility, which is not always supported within the research context. Finally, PAR can be applied to a wide range of contexts and it does not provide guidance on how cultural and language barriers could be addressed in projects. These need to be found elsewhere and/or developed by the researcher.

Part Two: Research Journey

In the spirit of the PAR approach adopted, a consistent aim across all three cycles of my research was to make a positive contribution to the Siyakhula Living Lab. The direction of the research evolved with research findings, resulting in two major changes in focus. Figure 4 below illustrates my research timeline with references to the section in this chapter where the stage is discussed in more detail.

Figure 4 Research journey timeline (with section references)



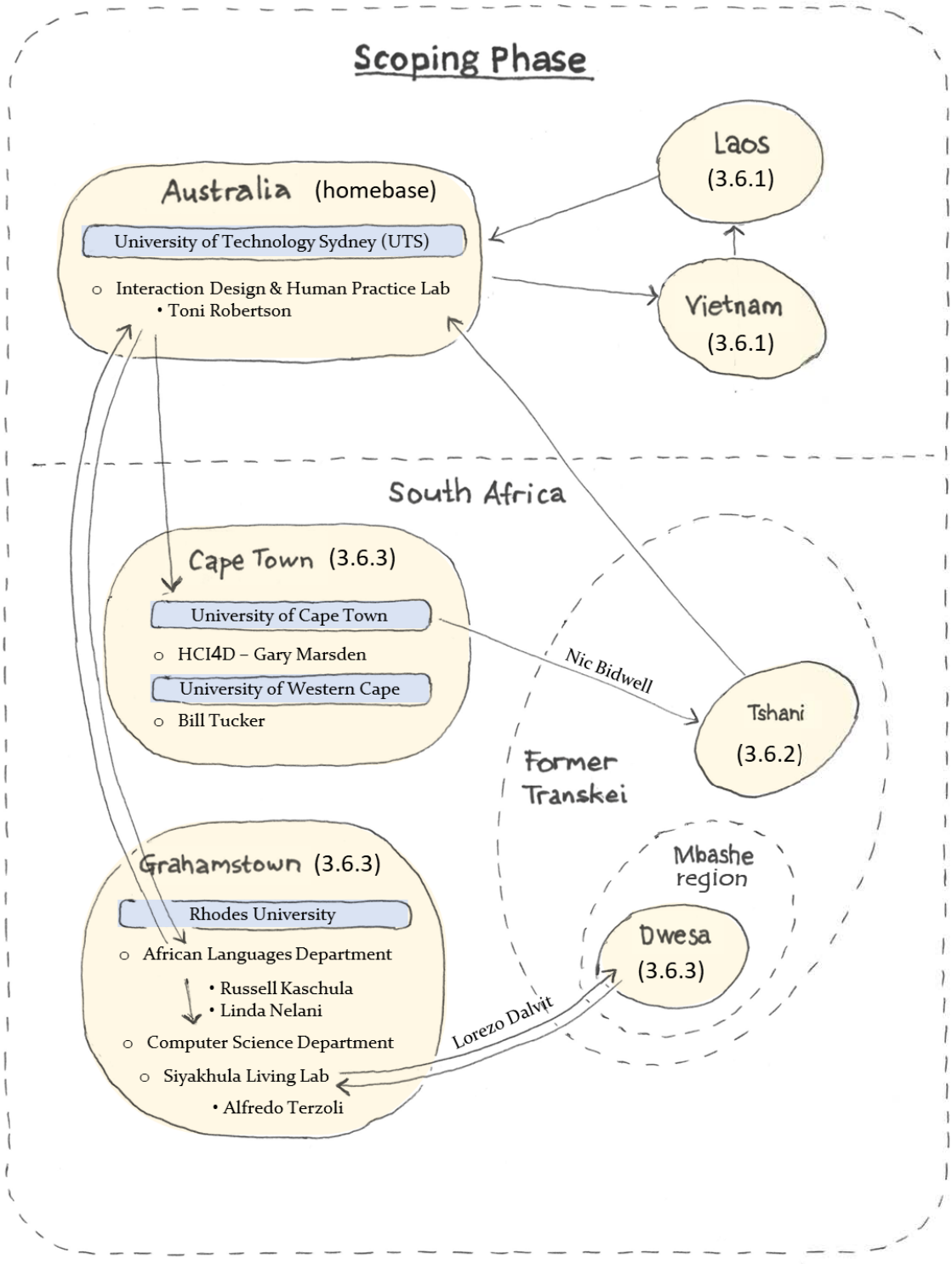
Part two of this chapter describes my research journey from the initial scoping phase identifying the Siyakhula Living Lab as the project I would join, through to the three cycles of research that took place. The aims and research questions for the three cycles of research are outlined, followed by a summary of the key activities and how findings influenced my research plan in each cycle. Chapter and section references have been included in figures for the remainder of this chapter where appropriate to assist navigation of the thesis.

3.6 Scoping phase: Identifying an ICT4D case study

The first step in the research journey was to find a suitable location and project. Three trips were taken over a period of ten months to three countries. Two

potential case studies, one in South Africa and one in Laos, were identified. South Africa offered the advantage of widely available mobile phones and mobile phone reception. Figure 5 illustrates the locations, groups and key people involved in making the relevant introductions that enabled my research to take place. The key people and groups involved in the scoping phase have been included in Figure 5 for two key reasons. The first is to acknowledge their role in supporting my research. The second is to emphasise the significance of personal relationships enabling this participatory action research to take place.

Figure 5 Scoping phase locations and key groups



The trips taken and the outcomes of each are described in sections 3.6.1 to 3.6.3.

3.6.1 Scoping trip 1 – South-East Asia

I travelled to Vietnam and Laos in January 2009, six months before my official PhD commencement date. Both of these countries are considered developing countries, are relatively close to Australia, and receive significant aid money from Australia. The purpose of the trip was to see if I would be able to spend significant periods of time in either country and to look for project opportunities. Part of the trip involved visiting friends who were doing development work through the AYAD (Australian Youth Ambassadors for Development) program in Vietnam and Laos to get some insight into their experiences as Australian expatriates living and working in Vietnam and Laos. During this trip, I was exposed to the expat lifestyle of foreigners working on aid projects in both Vietnam and Laos and by the end I had met with a contact who invited me to explore a potential collaboration on a health project in Laos. The opportunity in Laos wasn't pursued further following the scoping trips to South Africa when I realised I would only have time to do research in one country.

3.6.2 Scoping trip 2 – South Africa

The next exploratory trip was a three-week trip to South Africa in May 2009. I was invited to help run a workshop investigating a mobile digital story-telling application for the Nokia N95 by one of my mentors, Nic Bidwell. The workshop took place in Tshani, a village in the former Transkei area of the Eastern Cape Province of South Africa. South Africa was originally not considered as a potential research site, but helping run the workshop provided an opportunity for me to experience being part of a project in an emerging economy. This trip was also the first time I visited the African continent.

I spent two and a half out of the three weeks in Tshani and stayed at Mdumbi, a backpacker facility where the workshop took place. During the trip I created a list of items that I thought would be useful when conducting research in rural South Africa and kept a reflective journal. This trip introduced me to the former Transkei area and made me aware of the importance of considering the social footprint that I would leave behind as a researcher in the communities where I may work. The Tshani community and volunteers at Mdumbi backpackers were quite sensitive to

and weary of 'fly in/fly out' volunteers who unintentionally took more than they contributed. This was felt to be especially the case for university-based researchers. At the time, community members and volunteers perceived the university-based researchers to be focussed on their own research agenda, without appropriately considering if the community would experience benefit, especially in the short-term. This is in contrast to volunteers, whose focus was to work on something directly of benefit to the community, and backpackers, who were contributing to the local economy through their tourism.

For me, it made clear the importance of spending significant periods of time, (at least two weeks), to begin establishing relationships. It also reinforced the need to constantly reflect critically on my research practice. Dearden and Rizvi, (2008) stress the importance of fostering relationships, and constantly reflecting on research practice in ICT4D research, which was reinforced during this trip.

The experiences I had and the people I met in the two communities I visited in the former Transkei left a strong impression on me. At this stage, I hoped that I could pursue research opportunities in both South Africa and Laos simultaneously.

3.6.3 Scoping trip 3 – South Africa

The final exploratory trip was made to Grahamstown and Cape Town in South Africa in October 2009. Following the strong impression my first trip to South Africa in scoping trip 2 left me with, I decided to pursue project opportunities in South Africa in the former Transkei. The primary purpose of visiting Grahamstown was to begin learning isiXhosa in preparation for anticipated fieldwork in the deep rural areas of the Eastern Cape Province, where isiXhosa is the primary and often only language spoken by locals. The secondary purpose of the trip was to investigate project opportunities.

Through Russell Kaschula, the head of the School of Languages at Rhodes University in Grahamstown, I arranged a language tutor, Linda Nelani, and was introduced to the Siyakhula Living Lab. Following a discussion of my research interests with one of the project members, Lorenzo Dalvit, I was invited to take

part in a field trip to Dwesa, in the Mbashe region of the former Transkei. The purpose of the trip was to observe computer workshops run by Masters students in the Siyakhula Living Lab for teachers in the region. This was my first introduction to one of the Siyakhula Living Lab project sites and some members of the Dwesa community. Following this trip, a meeting was organised with Alfredo Terzoli, the project leader of the Siyakhula Living Lab, and I was subsequently invited to participate in a new part of the project set to launch a few months later. As I was exploring involvement in two other case studies at the time, we agreed that I would attend the project launch in Dwesa in early February 2010 and discuss involvement in the Siyakhula Living Lab following the launch.

The final part of the trip was a visit to the HCI4D lab at the University of Cape Town run by the late Professor Gary Marsden. Professor Marsden introduced me to the students in his lab and offered me a desk space to work from. I also met with Associate Professor Bill Tucker from the University of Western Cape, who was responsible for setting up the initial relationships with the Tshani community, whom I had visited in my first trip to South Africa several months prior. In this meeting we discussed the possibility of me working in that community.

This final scoping trip enabled me to revisit the South African context to both look for project opportunities as well as confirm my interest in doing research there. I also began developing basic isiXhosa skills. This helped provide insight into the Xhosa culture and eventually served as a tool to help foster relationships with rural and township community members. Finally, I began to set up a local research support network.

3.7 Cycle A: Investigating opportunities in the Siyakhula Living Lab to design a mobile health application

Following the project launch in Dwesa in February 2010, I decided to narrow my research focus to the Siyakhula Living Lab in South Africa, which triggered the first research cycle. It was clear at this stage that the time investment required to build relationships and understand the South African context would only leave enough time for involvement in one project. Research cycle A consisted of contextual immersion involving eight trips to South Africa, including five trips to Dwesa in the Mbashe region, conducting a series of stakeholder interviews over a period of one year, getting to know the ICT4D field and developing ideas about what my contribution to the Siyakhula Living Lab could be. Early in cycle A, my intention was to investigate the role of ICTs for delivering services to communities through designing and building a mobile health application for communities in the Mbashe region.

My research aims and questions in cycle A are described in 3.7.1. This is followed by a description of research activities under their respective headings in 3.7.2 to 3.7.5. Finally, how these activities contributed to the research plan as well as how they relate to PAR are discussed and illustrated in 3.5.6.

3.7.1. Cycle A research aims and questions

My research aims and corresponding research questions in cycle A are listed below in Table 5.

Table 5 Research aims and questions for cycle A

Aim 1A: Make a positive contribution to the Siyakhula Living Lab and its related communities.

Research question 1A: What are the agendas, visions, perceived benefits, reservations and success criteria of key stakeholders in the Siyakhula Living Lab?

Research question 2A: What are potential opportunities for me to contribute to the Siyakhula Living Lab?

Aim 2A: Familiarise myself with the South African context.

Research question 3A: What cultural factors need to be taken into account when identifying suitable research methods in South Africa?

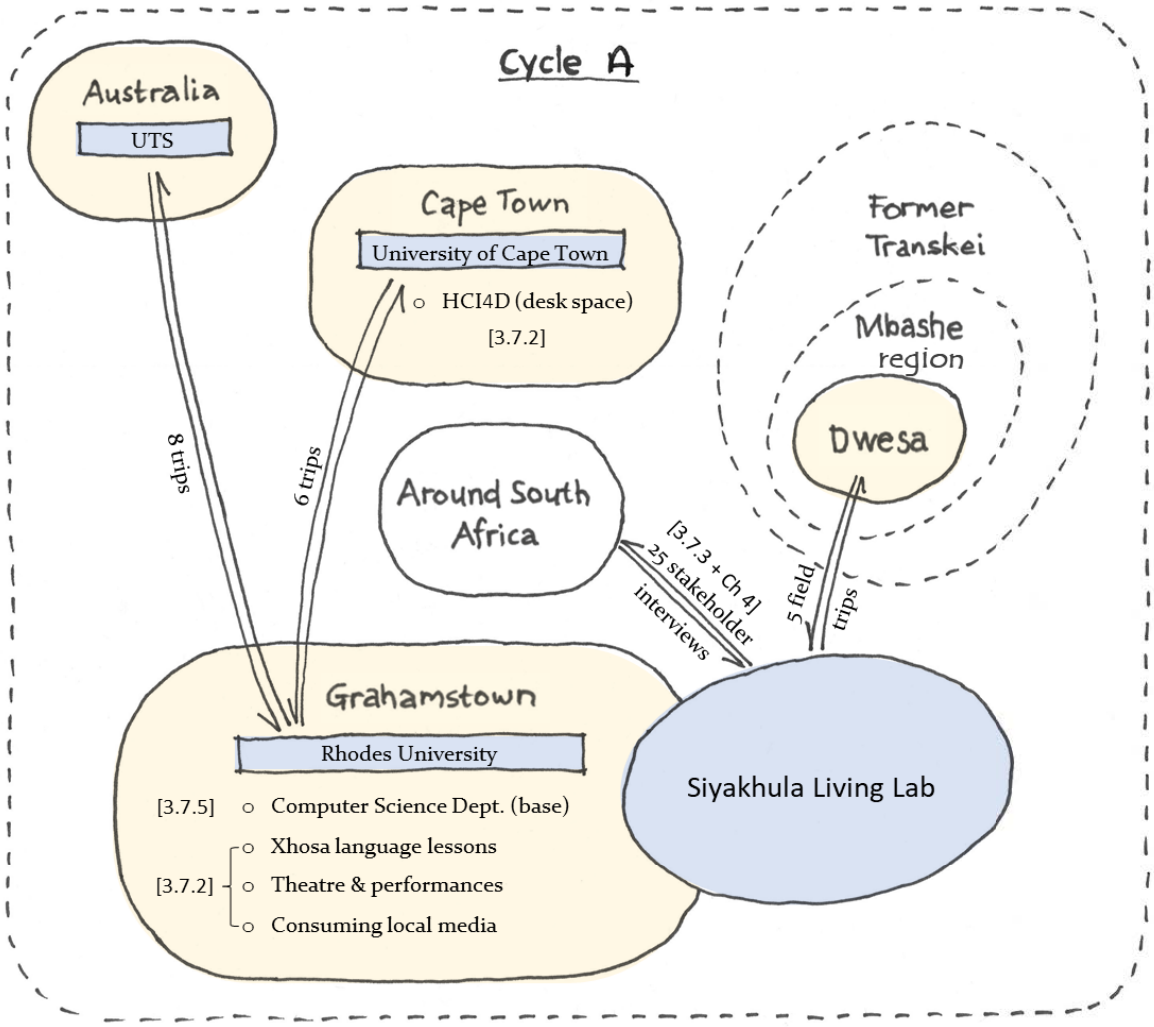
Research question 4A: What is the potential role of ICTs for delivering services to communities in South Africa?

Aim 3A: Design a mobile health (or other service) application for communities in the Mbashe region of the former Transkei as part of the Siyakhula Living Lab.

Research question 5A: What are the challenges designing technology for socioeconomically disadvantaged communities in a culturally unfamiliar context?

The context for research cycle A involved communities situated in the Mbashe Region of the former Transkei in South Africa who were engaged by the Siyakhula Living Lab. Key locations, groups and activities are illustrated in Figure 6, below.

Figure 6 Cycle A research locations and activities



3.7.2 Contextual immersion and research base set up in South Africa

Immersion in the South African context began with a five week trip to Grahamstown and the Siyakhula Living Lab in February 2010. During this trip I attended the launch of the Digital Access Node, a new initiative within the Siyakhula Living Lab, and immersed myself in the activities and people in the project. These activities supported a mutual fit between the Siyakhula Living Lab and my research. During the trip it was clear that the scale of the Siyakhula Living Lab project was large enough to warrant a sole case study. In addition, I realised that I would significantly increase my chances of making a positive contribution to the Siyakhula Living Lab if I were to base myself in South Africa for the majority of my research and focus on getting to know this one new cultural context.

Image 1: Speeches at the launch of the Digital Access Node in February 2010

Image 2: Dwesa community members at launch of the Digital Access Node

Significant key outcomes of this five week trip were:

1. The decision to focus on the Siyakhula Living Lab as a single case study, and
2. A research base in Grahamstown, South Africa, was successfully established. This included office space at Rhodes University, access to necessary equipment, library access, a visiting researcher visa and long-term accommodation.

I made seven additional trips between South Africa and Australia during research cycle A to maximise my chances of understanding the context and making a

contribution. The extended time spent in South Africa not only helped me better understand the South African cultural context, but helped my transition from an 'outsider' to 'pseudo-local'. Six trips were also made to Cape Town to spend time with the HCI4D group at the University of Cape Town. The purpose of these trips was to share ideas and discuss challenges with other students working on ICT4D projects in South Africa who were familiar with HCI.

Xhosa language lessons

I continued my isiXhosa language lessons in the subsequent trips to South Africa to facilitate building relationships and communicating with members of the Mbashe communities. Despite my isiXhosa skills remaining basic for the duration of my research, the amaXhosa (Xhosa people) generally appreciated the attempt to speak their language, rather than assuming all conversation would be in English. The process of learning isiXhosa provided useful insights into the Xhosa culture, in particular the focus on family and place of origin in the first three short course modules. The communal nature of the Xhosa culture was also reflected in the Xhosa language. For example, when greeting people you encounter, you address them as you would a member of your direct family depending on their relative age. A female who is similar to your mother, would be addressed as 'mama' (mother) whereas a female of a similar age to you would be addressed as 'sisi' (sister). The language used when greeting each other reflects the values of the Xhosa culture, where a community is seen as a large family that extends beyond purely blood relations.

Reviewing local media and performances

During this period of immersion and understanding of the South African culture and context, (Aim 2A: Familiarise myself with the local context), I read South African novels in addition to watching films and documentaries based in the area I was working, noting my learnings and reflections. Novels, films and documentaries also helped me to re-engage with the South African context after long periods of absence from South Africa in the early stages of my research, and stay connected during my trips back to Australia. Music and drama performances at the National Arts Festival held annually in Grahamstown also provided insights

into local and national historical and contemporary issues. Documentaries and non-fiction texts were useful for providing facts and factual insights into the Xhosa culture.

Fiction novels, films and performances also helped enable me to 'put myself in another man's shoes', more easily than non-fiction texts, through engaging with characters and their journey in a story world. There were also occasionally examples that not only facilitated empathy for the cultural context, but exposed frustrations held by some that were relevant for my research context. For example, in Zakes Mda's 'The Heart of Redness' the protagonist, a Xhosa man returning from exile after apartheid ended, challenges a white store owner on his approach to his water project for the village. He suggests that the reason for its failure is the following.

> *'..it was imposed on the people. No one bothered to find out their needs...perhaps the first step would have been to discuss the matter with the villagers, to find out what their priorities are. They should be active participants in the conception of the project.. Then it becomes their project. Then they will look after it.' (Mda 2003, p207)*

The potential roles of fiction novels, films, documentaries theatre and performances are elaborated in Chapter 7.

3.7.3 Stakeholder interviews

The first formal, structured research activity of this research cycle was a series of interviews with 25 key stakeholders from the Siyakhula Living Lab. The purpose of the interviews was primarily to address research questions 1A and 2A. That is, 1A: (Understand stakeholders' agendas, visions, reservations and success criteria for the Siyakhula Living Lab) and 2A: (Identify potential opportunities for me to contribute to the Siyakhula Living Lab). Stakeholders interviewed included academic, industry, government and community stakeholders. The study, purpose and findings of the stakeholder interviews are discussed in more detail in Chapter 4.

The final stakeholder interviews with community members ended research cycle A. It was clear from the findings of those interviews that my original intention of developing a health or education mobile application was not realistic in a limited timeframe, particularly given the relative lack of engagement and education of community members in the Mbashe region. This was despite the number of years the Siyakhula Living Lab had been operating in schools there.

3.7.4 Field trips to the Mbashe region in the former Transkei

I made five trips in total to the Mbashe region in the former Transkei in research cycle A. Despite working with communities in the former Transkei region being one of my key original motivations to join the Siyakhula Living Lab, relatively few trips were made. Each of the field trips were short, ranging from one to four days. Field trips were made opportunistically, as I joined existing trips to the Transkei by academics and students, rather than specifically requesting my own. This was in part due to the distance of the Mbashe region from Rhodes University and the time and expense travelling there. It was a seven-hour drive from Rhodes University to the former Transkei and there was limited accommodation and research infrastructure there. The limited number of trips were also reflective of my initial research priority, which was to understand the Siyakhula Living Lab and its key stakeholders' perspectives before working out what my contribution would be.

Image 3: Entering the Wild Coast on the way to the Mbashe region on one of the last stretches of sealed road before the unsealed drive begins.

Image 4: Mbashe region of the former Transkei. Despite limited access to power and utilities, mobile reception is good. A mobile tower can be seen faintly in the top right of this picture.

Each field trip gave me further insight into communities in the Mbashe region, conditions, issues and the current activities of the Siyakhula Living Lab. However, as the villages visited were different for most of the trips and the trips were short, there was little opportunity to form and build relationships with community members or deeply immerse myself in the communities' contexts.

3.7.5 Contributing to the Siyakhula Living Lab and Rhodes Computer Science Department

In the spirit of the PAR approach adopted, I looked for ways the Siyakhula Living Lab or Rhodes University could receive some sort of benefit from me being there. Some examples of my contributions to the Siyakhula Living Lab and Rhodes Computer Science Department in research cycle A included:

- Writing an article about the launch of the Digital Access Node in February for the Rhodes University website,
- Proof-reading a PhD thesis from a Computer Science student,
- Supervising four Finnish students upgrading the Siyakhula Living Lab websites and creating marketing material for the Siyakhula Living Lab to use at conferences, and
- Exploring potential collaboration opportunities with academics and students at UTS.

These contributions helped build the trust and autonomy I required to pursue the research in cycles B and C.

3.7.6 Contribution of cycle A activities to the research

The activities outlined above contributed to understanding the cultural, project and academic context where my research was situated. I developed an understanding of the Siyakhula Living Lab project context and built relationships with the project team. Findings from research cycle A, in particular from the final two stakeholder interviews, significantly affected my research aims and directions in three major ways.

- *The first* was realising the usefulness and significance of conducting stakeholder interviews within an ICT4D context. This led to adding two research questions, (1B and 2B), in research cycle B on the impact and benefits of conducting stakeholder interviews.

- *The second* was discovering how relatively un-engaged members of the Siyakhula Living Lab communities were in the Siyakhula Living Lab initiative. The lack of engagement, in combination with the challenges getting there and living there, made me realise that my initial aim to design and develop a mobile health or education application was a larger task than was possible in my remaining time.

- *The third* was the realisation that if I wanted to be part of the design and development of something new, I would need to focus on more local options. For example, designing an e-Service application for the socioeconomically disadvantaged communities at my doorstep, in the townships surrounding Grahamstown.

This final realisation lead to my adjustment of aim 2A and its related research questions (from: 2A understanding the South African context, to: 2B understanding the Egazini Outreach Project context) and aim 3A and its related research questions (from: 3A designing a mobile health application for the former Transkei, to: 3B designing an e-commerce application for the Egazini Outreach Project). These are outlined and expanded on next in Section 3.8.

3.8 Cycle B: Designing an e-commerce mobile application with the Egazini Outreach Project

Research cycle B began with investigating local project options in the townships surrounding Grahamstown. Early in my time in South Africa, locals had advised me that townships should be avoided because they were considered dangerous with a high incidence of crime. However, after having spent a significant amount of time in South Africa over the previous 18 months and immersing myself enough to start to form my own opinion, I was open to the possibility of working on a project in a township. The time spent familiarising myself with Grahamstown was key to my openness to explore research opportunities in Joza, the largest and longest established of the townships close to Grahamstown. This laid the foundation for me working with the Egazini Outreach Project, a local initiative involving a number of artists based in Joza who specialised in creating linocuts that depicted historical and contemporary aspects of the local area. Revised research aims and questions, and key activities carried out in research cycle B are described next.

3.8.1. Revisions to research aims and questions for cycle B

Following findings from cycle A, research questions relating to aim 2A (understanding the broad South African context) became more focussed in aim 2B to understanding the Egazini Outreach Project context specifically. An additional change was to aim 3A and its related research questions from designing a mobile health application for the Mbashe region, to aim 3B, designing an e-commerce application for the Egazini Outreach Project. Aims and research questions for cycle B are listed below in Table 6.

Table 6 Research aims and questions for cycle B

Aim 1B: Make a positive contribution to the Siyakhula Living Lab and related communities.

Research question 1B: How can stakeholder interviews influence an ICT4D project contribution?

Research question 2B: What are the benefits of conducting stakeholder interviews in ICT4D projects?

Research question 3B: What are potential opportunities for me to contribute to the Siyakhula Living Lab?

Aim 2B: Familiarise myself with the Egazini Outreach Project context.

Research question 4B: What cultural factors need to be taken into account when identifying suitable research methods for understanding and engaging the Egazini Outreach Project artists?

Research question 5B: What are the needs, motivations and familiarity with technology of the Egazini Outreach Project artists?

Research question 6B: What is the potential role of ICTs for providing a useful service for the Egazini Outreach Project artists?

Aim 3B: Design an e-commerce application for the Egazini Outreach Project artists to sell their artwork online.

Research question 7B: What are the challenges designing technology for socioeconomically disadvantaged communities in a culturally unfamiliar context?

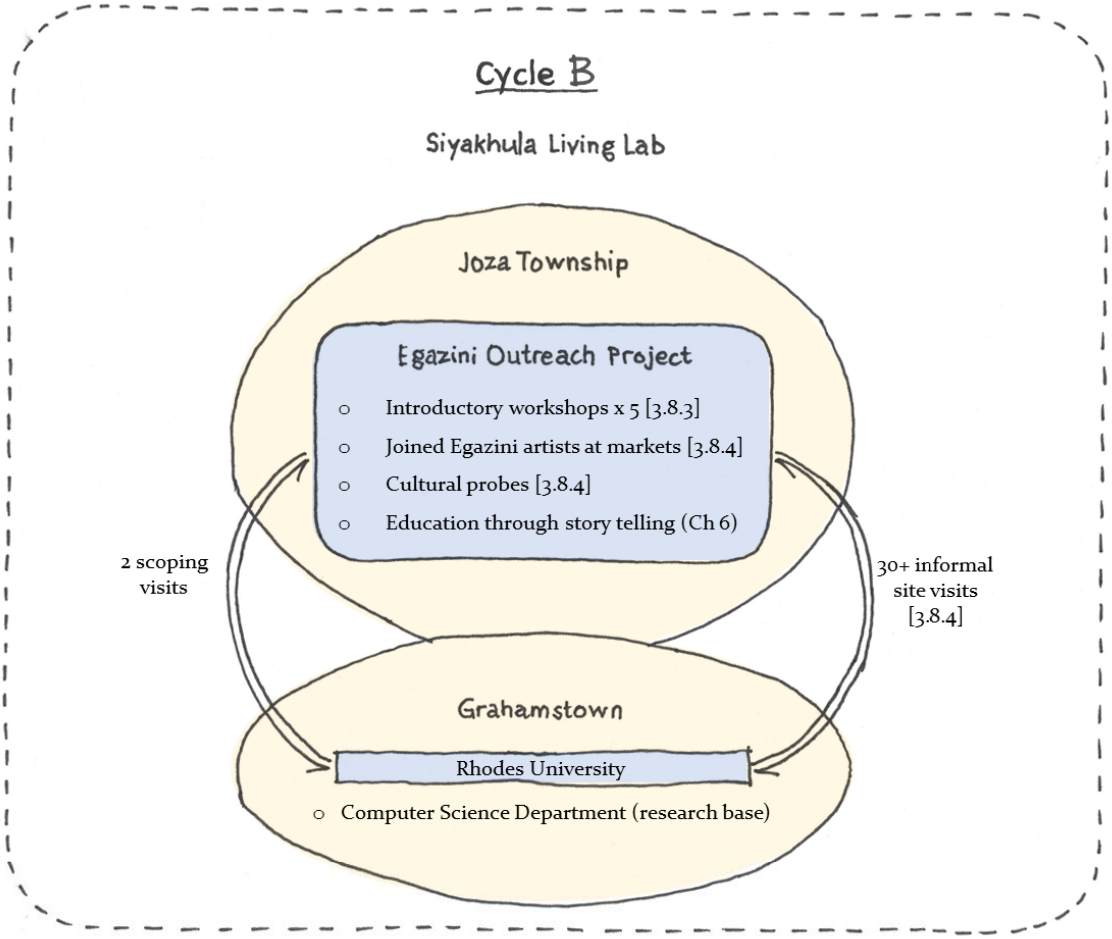
Research question 8B: How can methods used in participatory design be adapted to give Egazini Outreach Project artists a meaningful voice in the design of an e-commerce app to sell their artwork online?

3.8.2 Engaging the Egazini Outreach Project

One of the initiatives within the Siyakhula Living Lab was an industry startup called Reed House Systems. A high level aim of Reed House Systems was to create a middleware platform to enable better access to online services for communities, particularly in rural areas such as the Mbashe region in the former Transkei. One of the most common examples used to communicate the purpose of the middleware platform publically was to use the example that the middleware platform could help local artists, especially those in rural areas, sell their arts and crafts online. However, despite frequently citing this example, the last time anyone in the Siyakhula Living Lab had spoken to an artist had been more than two years prior to my arrival in South Africa.

I initially learned about the Egazini Outreach Project after discovering it in a Grahamstown tourist pamphlet and had visited them as a tourist in early 2011 while in research cycle A. Following the realisation at the end of cycle A that my initial plans to design an application for communities in the Mbashe region would not be possible in the remaining timeframe, I remembered the Egazini Outreach Project when trying to think of more local opportunities. I discussed the idea of approaching the Egazini Outreach Project to be a research partner with members of the Siyakhula Living Lab and received support to pursue the idea. Two scoping visits were then arranged to establish the Egazini artists' interest in the engagement and formal research activities began through a series of introductory workshops. The Egazini Outreach Project and my involvement with them are described in more detail in Chapter 5. Figure 7 illustrates the key research locations and activities conducted in research cycle B.

Figure 7 Cycle B research locations and activities



The activities conducted in cycle B and key research outcomes are outlined briefly below under their corresponding headings.

3.8.3 Introductory workshops

Research cycle B began with a series of introductory workshops for the Egazini Outreach Project artists and I to get to know each other. Establishing relationships with the artists was an important part of gaining trust and enabling open communication and collaboration. Earlier, insights into the importance of relationship building were reinforced during the first scoping visit to the Egazini Outreach Project when one of the artists mentioned they would be happy to work with me, but pointed out that they did not know me.

Five introductory workshops took place over a period of five weeks. Lunch was provided at each of the workshops as a way of acknowledging people's time and putting into practice a learning from my first trip to South Africa, that is, that all good workshops have food and participants both expect and appreciate it. The initial workshop began with high level introductions. This was followed by Linda Nelani (my isiXhosa teacher and now interpreter) and I sharing our background stories and photos over lunch. In the following four introductory workshops, two or three artists shared their history, background and how they came to be part of the Egazini Outreach Project.

The introductory workshops helped to build and establish a strong foundation for a relationship with the Egazini artists, as well as providing insights into the environment, conditions and constraints in which they worked and in which the intended e-commerce application would be used. The most significant insight for this research from the introductory workshops was the Egazini artists' lack of understanding of the internet. These workshops are described in more detail in Chapter 5, Section 5.2.2.

3.8.4 Site visits and fieldwork

I visited Egazini more than 30 times over a period of six months. In addition, I joined the artists on trips to markets when possible, and visited most of them in their homes at least once. Notes, observations, questions, ideas and insights were captured in a structured way in a GoogleDocs spreadsheet set up directly after the initial introductory workshop, and kept for the duration of the project.

These frequent visits to the Egazini Outreach Project helped give me deeper insight into the context that the e-commerce application would be used, including the work and lives of the artists involved. It also helped build and maintain relationships with the artists. The site visits and fieldwork are described in more detail in Chapter 5, Section 5.2.3.

Inspired by the potential of cultural probes as a non-invasive tool to get insight into people's lives (Gaver, Dunne & Pacenti 1999), disposable cameras were

distributed to each of the artists participating in the project at the final introductory workshop. The insights and reflections on the use of the disposable cameras are discussed in Chapter 5, Section 5.2.5.

3.8.5 Using storytelling for education: The conception of Interplay

A basic level of understanding of the possibilities and limitations of the internet was needed for the artists to be able to meaningfully participate in the creation of an e-commerce application to help them sell their arts and crafts. The introductory workshops made clear the artists' lack of understanding of the internet and minimal exposure to technology.

Storytelling is the traditional way of sharing knowledge for the amaXhosa and was investigated as a way of enabling learning about the internet, as well as providing an avenue for mutual learning for project team members. At the time, the Egazini artists shared their space with a group of actors, which offered serendipitous support for the use of theatre for education in this context.

An additional motivation to explore the use of storytelling for education about the internet was a commitment to exploring approaches that were tailored for the cultural context, rather than simply applying traditional Western derived techniques. An educational approach that resonated with this group of older artists was especially important given the relatively low levels of formal education attained by most of the artists. A more comprehensive account of the development of Interplay, the educational play, is provided in Chapter 6.

The play was well received by the artists and achieved its goal of helping the artists better understand the possibilities and limitations of the internet. The recognition of the broader potential usefulness of a play as an educational tool for communities beyond the Egazini Outreach Project was recognised during the production of Interplay.

The unexpected amount of time it took to produce Interplay, in addition to the recognition of the usefulness of Interplay beyond the Egazini Outreach Project contributed to research cycle B being a relatively short cycle. The production of

Interplay was also retrospectively identified as being the start of the third and final research cycle, cycle C.

3.8.6 Contribution of cycle B activities to the research

The introductory workshops, disposable cameras, site visits and fieldwork each added to my understanding of the Egazini Outreach Project and the Egazini artists' lives. Insights gained contributed to understanding their needs and motivations and the creation of a preliminary list of requirements for the e-commerce application. These requirements were shared with the Siyakhula Living Lab team.

The introductory workshops revealed a gap in some of the Egazini artists' understanding of the internet, which was the catalyst for the production of Interplay as a culturally tailored way to communicate the possibilities of the internet. It quickly became evident that with the amount of time needed for the production of this educational play, the design and implementation of an e-commerce solution would be not be possible within the scope of my research and remaining time. However, finding ways to support meaningful participation was considered a priority before other things could be done.

The production of Interplay marked the transition of my research aim 3B and its related research questions from: designing an e-commerce application for the Egazini artists to sell their artwork online, to: research aim 2C and its related research questions, creating an educational play so the Egazini artists can better understand the possibilities and limitations of the internet. These updated aims and research questions are outlined and expanded on next in Section 3.9.

3.9 Cycle C: Producing an educational play about the internet

The conception of Interplay marked the beginning of the third and final cycle of research, research cycle C. Through the process of producing and piloting Interplay, it was clear that the relevance of the play extended beyond its usefulness as a tool to explain the possibilities the internet offered to the Egazini Outreach Project artists. The production of Interplay also shifted the intended contribution of this research from the account of designing an application for a community in South Africa to a methodological contribution. The research aims questions and major research components of research cycle C are described under their respective headings below.

3.9.1 Revisions to research aims and questions for cycle C

My research aims and questions underwent one final revision in research cycle C. The most significant change was from key aims to design a technology solution in cycles A and B, to a methodological aim in cycle C. Specifically, the aims to design an e-health (aim 3A) or e-commerce (aim 3B) application, were changed to the aim of producing an educational play about the internet (aim 2C). Cycle C, and my final research aims and questions are detailed in Table 7.

Table 7 Research aims and questions for cycle C

Aim 1C: Make a positive contribution to the Siyakhula Living Lab and related communities.

Research question 1C: How can stakeholder interviews influence project contributions?

Research question 2C: What are the benefits of conducting stakeholder interviews?

Aim 2C: Create an educational play so the Egazini Outreach Project artists can better understand the possibilities and limitations of the internet.

Research question 3C: What is involved in producing an educational play for a non-English speaking audience?

Research question 4C: How will the theatre piece for education and engagement affect the Egazini Outreach Project artists' understanding of the internet?

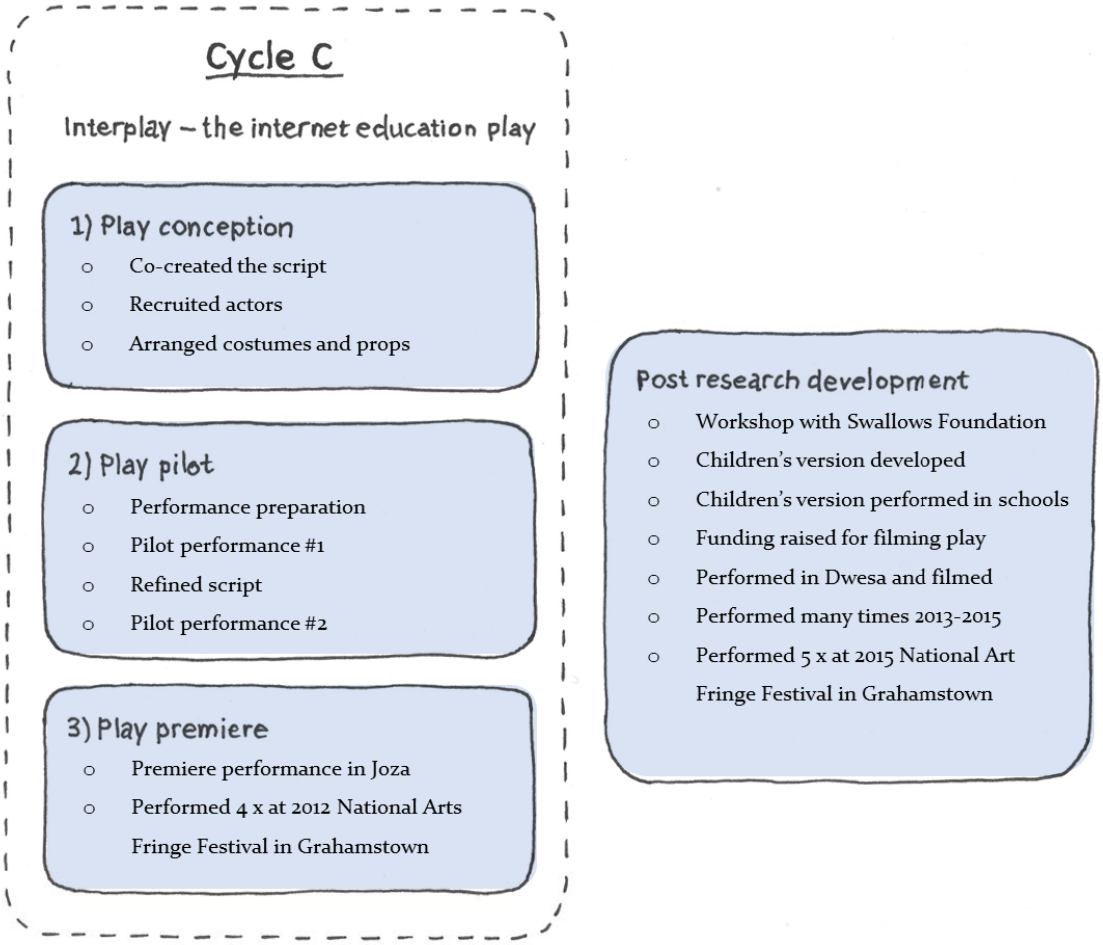
Research question 5C: What are other potential uses for the educational play?

Aim 3C: Ensure benefit to the community remains once my PhD research has been completed.

The addition of aim 3C involved a gradual wrapping up and handover process of my research in preparation for leaving South Africa to return to Australia.

Figure 8 below, provides an illustration of the key activities and milestones of the creation and performance of Interplay, the focus of research cycle C. In addition, a selection of significant post-research milestones relating to Interplay are described.

Figure 8 Cycle C research activities



3.9.2 Co-creation of Interplay script

A collaborative approach was adopted for the creation and iteration of Interplay. This was important as the play needed to meet the criteria of communicating an educational message. It also needed to be culturally relevant and hopefully entertaining as a piece of theatre. The primary writer of Interplay was Thozi Ngeju, a writer from the Joza Township who did casual work for the Computer Science Department. After being briefed on the aim and scope of the play, he produced an initial draft. This was reviewed between Linda Nelani, (my isiXhosa teacher), a Computer Science lecturer and myself and underwent three main rounds of changes.

Two pilot performances took place in front of an audience of staff and students from the Drama, African Languages, Education and Computer Science

departments. The performances were filmed and a feedback session took place after each performance to give the audience members the opportunity to share their thoughts, ideas and questions.

In addition to receiving feedback from staff and students from Rhodes University and community members, the actors were encouraged to provide input into the script and indicate areas that were unclear, missing or misrepresented. This continued throughout their entire involvement in the play. A comprehensive account of the creation of Interplay is provided in Chapter 6.

3.9.3 Producing Interplay

There were many elements required to produce Interplay. The Rhodes University Drama Department provided guidance to compensate for my lack of familiarity with theatre. Financial support for the National Arts Festival application and for the actors' time was provided by the Rhodes Computer Science Department. The relationships that had been built throughout my time in South Africa were instrumental in being able to negotiate the necessary support to enable the production of Interplay as a 'pseudo-insider' rather than an 'outsider'.

Costumes were sourced through the actors' personal clothing, new clothing purchased from stores and bespoke costumes made by the Egazini Outreach Project women. Commissioning the Egazini Outreach Project women to make the costumes was a way of being able to see where Egazini may be able to benefit from Interplay, in this case, through a work opportunity. Details of the production of Interplay are described further in Chapter 6 along with a list of items that were useful.

3.9.4 Interplay performances

The first public performance of Interplay took place at Noluthandu Hall in Joza, one of the townships of Grahamstown. The primary audience for this performance were the Egazini Outreach Project artists, but their friends, family and other community members were welcome to attend. Light catering was provided following the performance for the artists and community.

Interplay was performed four times during the annual National Arts Fringe Festival. The Egazini artists were invited to see Interplay again at the festival with their friends and family. During the festival, the African branch of the Swallows Foundation, an arts and culture partnership between the North East of England and the Eastern Cape of South Africa (Swallows Partnership 2016), expressed interest in using Interplay as an educational tool for school children. Several months after the festival, the Swallows Foundation held a workshop with the actors where they revised the script with the actors and gave feedback about the actors' performances. This revised version of Interplay has continued to be performed in schools in the Eastern Cape to this day. Further description of the Interplay performances is provided in Chapter 6.

3.9.5 Contribution of cycle C activities to the research

The activities carried out in cycle C centred on the creation and performance of Interplay, an educational play exploring the possibilities and limitations of the internet. The play was conceived because of the relationship between storytelling and passing on knowledge in the Xhosa culture. Capturing and reflecting on the process of producing Interplay helped explore the positive and negative aspects of the use of culturally tailored methods and approaches.

The creation of Interplay also enabled me to fulfil the first two aims of research cycle C, that is, aim 1C (Make a positive contribution to the Siyakhula Living Lab and related communities) and aim 2C (Create an educational play so the Egazini Outreach Project artists can better understand the possibilities and limitations of the internet). The final aim of research cycle C aim 3C (Ensure benefit to the community remains once my PhD research has been completed) was addressed in the wrap up and handover process after Interplay was performed. This wrap up process along with the production and performances of the play are described in more detail in Chapter 6.

4

Stakeholder Interviews

Conducting stakeholder interviews was a key research activity that took place in research cycle A. The demonstration of the value of conducting stakeholder interviews in an ICT4D project is one of the contributions of this thesis.

This chapter outlines the motivation, study design, selected findings and discussion of the stakeholder interviews conducted in the Siyakhula Living Lab. This chapter also provides insights into how the stakeholder interviews influenced making a relevant contribution in the Siyakhula Living Lab and reflects on the broader value of conducting stakeholder interviews in ICT4D projects. A summary of research cycle A is also included.

Engaging with stakeholders and capturing their perspectives is a relatively common practice in the social sciences. The Participatory Design, Computer Supported Cooperative Work (CSCW) and Information Systems (IS) literature have long recognised that understanding stakeholder perspectives increases the chances of developing a successful and accepted system. However, in ICT4D projects, stakeholder interviews are generally done in an informal manner, if at all, despite their potential to contribute high value at relatively low cost. Reasons for formal stakeholder interviews not being conducted more often in ICT4D projects likely vary.

The value of formally capturing stakeholder perspectives in large collaborative projects was demonstrated in a telemedicine project I was part of at the CSIRO (Hansen 2007; Hansen et al. 2008). Despite CSIRO's long track record of being involved in technology projects, the team there had not thought to conduct stakeholder interviews. They were open to doing so on recommendation and considered the findings valuable to the project. It's possible that a common reason why stakeholder interviews are not conducted more frequently in ICT4D projects may be as simple as teams not thinking about it.

Stakeholder perspectives had not been formally captured in the Siyakhula Living Lab so I requested permission to do so from the director of the project. The broad aim of the stakeholder interviews was to understand the Siyakhula Living Lab context and look for opportunities for me to contribute to the project. The director recognised their potential value and supported the interviews.

Chapter 4 reports on the stakeholder interviews conducted in the first cycle of my research. A recap of the research aims and questions for cycle A are included in Table 8 below for context.

Table 8 Recap of research aims and questions for cycle A

Aim 1A: Make a positive contribution to the Siyakhula Living Lab and its related communities.

> **Research question 1A**: What are the agendas, visions, perceived benefits, reservations and success criteria of key stakeholders in the Siyakhula Living Lab?
>
> **Research question 2A**: What are potential opportunities for me to contribute to the Siyakhula Living Lab?

Aim 2A: Familiarise myself with the South African context.

> **Research question 3A:** What cultural factors need to be taken into account when identifying suitable research methods in South Africa?
>
> **Research question 4A**: What is the potential role of ICTs for delivering services to communities in South Africa?

Aim 3A: Design a mobile health (or other service) application for communities in the Mbashe region of the former Transkei as part of the Siyakhula Living Lab.

> **Research question 5A**: What are the challenges designing technology for socioeconomically disadvantaged communities in a culturally unfamiliar context?

4.1 Aim

As mentioned earlier in Chapter 1 (Section 1.2.1), the Siyakhula Living Lab was a collaborative initiative between academia, industry, government and communities. The key high level formally stated objective of the Siyakhula Living Lab was to create, test and deploy ICT solutions to empower and benefit marginalised communities in South Africa (ESTIMA 2009).

The aim of the stakeholder interviews was to understand the Siyakhula Living Lab project ecosystem which had not been formally captured previously. Another aim was to address research question 1A, which was to capture key stakeholders agendas, visions for the project, perceived benefits, reservations and success criteria in their words for the following reasons:

- **Agendas** - to understand what stakeholders and their organisations hoped to gain from the experience of being involved in the Siyakhula Living Lab
- **Visions for the project** - to capture stakeholders visions for the Siyakhula Living Lab
- **Perceived benefits** - to record benefits as perceived by the stakeholders with the potential to discover benefits that had not been anticipated by the Siyakhula Living Lab project team
- **Reservations** - to help anticipate issues, potential problems and risks
- **Success criteria** - to understand what criteria would need to be fulfilled in order for stakeholders to consider the Siyakhula Living Lab project to be a success

An additional aim of the study relates to research question 2A, that is, to identify potential opportunities for me to contribute to the Siyakhula Living Lab.

4.2 Stakeholder interview study design

This section describes the interviews conducted with key stakeholders in the Siyakhula Living Lab. The stakeholders interviewed were primarily from academia, industry or government. A significant group that were not well represented in this

study were community members, with only two key community members involved in the Siyakhula Living Lab interviewed.

There are two main reasons for this. The main members of the communities that had been involved with the Siyakhula Living Lab project at that time were teachers. Despite the Siyakhula Living Lab having good access to teachers in Dwesa, teachers in these rural communities were rarely local and often returned to their hometowns on the weekends and school holidays. As a result, they were not necessarily actively involved with members of the broader community and therefore could not be expected to represent their views.

The second reason was that a more culturally tailored method of gathering community perspectives than stakeholder interviews using a predefined interview guide felt like it would be more appropriate. Reasons for wanting a culturally tailored method included:

- The unequal power relationship between me as the interviewer and community members that may have led to participants saying what they thought I wanted to hear rather than what they actually felt,
- Cultural factors such as the importance of building relationships with people before engaging them in any research activities,
- The general lack of awareness of the Siyakhula Living Lab amongst the broader community, and
- Language barriers that may have made the interview process more susceptible to miscommunication and misunderstandings where translators were involved.

While some of the above factors may have influenced the other stakeholder interviews, the combination of these factors made it more likely to have a significant impact on community members.

A detailed explanation of the proposed strategy for engaging additional members of the community was beyond the scope of these interviews but is discussed briefly in Section 4.6: Future Work. The method (instrument), participants selected for

the study and data analysis strategy are outlined under their respective headings below.

4.2.1 Method

A semi-structured interview guide containing 11 broad questions was adapted from a stakeholder interview guide used to capture stakeholder perspectives in a large telemedicine project (Hansen et al. 2011). This guide was piloted on a Rhodes University stakeholder to assess its clarity and structure. Immediately following the pilot interview, a follow-up interview was conducted with that stakeholder to explore their experience as an interviewee, the structure of the interview guide and the wording. The interview guide[4] was then modified to reflect the changes suggested and administered to 25 people from 11 organisations in academia (10 people), industry (9 people), government (4 people) and the community (2 people).

Participants were interviewed face to face or by phone and interviews were recorded using a digital dictation device. Phone interviews were only conducted when a face to face interview was not possible in the desired time frame and the interviewees were already known to me. Interviews lasted between eight minutes and 45 minutes with an average interview duration of 22 minutes. The interview length varied depending on the stakeholder's knowledge of the project, how much they had to say and how much time they had available. Following each interview, the recordings were transcribed. The transcriptions were then reviewed and cleaned to improve their accuracy and then finally analysed. A description of the participants and data analysis under their respective headings is included next.

4.2.2 Participants

Key stakeholders involved in the Siyakhula Living Lab were identified primarily through the Siyakhula Living Lab Management Unit (SiLLMU) and then either contacted directly by me or by someone from SiLLMU to participate in the

[4] The interview guide used for the stakeholder interviews is included in Appendix 1.

interviews. All of the respondents contacted agreed to be interviewed and signed consent forms.

The stakeholders were based in several different locations in South Africa (see Figure 9). The majority of industry stakeholders were based in Johannesburg, the majority of government stakeholders based in Pretoria, the university stakeholders were based at Rhodes University in Grahamstown or the University of Fort Hare in Alice, and finally community stakeholders were based in Dwesa in the Mbashe region of the former Transkei.

Figure 9 Key stakeholder locations in South Africa

The geographical distance coupled with a large and diverse range of stakeholders, made it especially important to formally gather each of their perspectives and provide them with the opportunity to share their perspectives with the project team.

The stakeholder group, organisation and roles in the organisation of the participants are captured in Table 9, below.

Table 9 Organisations and roles of participants interviewed

	Organisation / Department	Job role
	ACADEMIA	
	Rhodes University	
1	Computer Science Department	Head of Telkom Centre of Excellence (CoE)
2		Leader of the Mobile Research Group
3		Project Coordinator of the Telkom CoE
4	Education Department	Senior Lecturer
5	Siyakhula Living Lab Management Unit	Project Lead
6	School of Languages	Head of School
7	Information Systems Department	Lecturer
8	Department of Anthropology	Professor
	University of Fort Hare	
9	Computer Science Department	Head of Telkom Centre of Excellence (CoE)
10	Department of Communication	Researcher for Siyakhula Living Lab
	INDUSTRY	
11	eKhaya ICT/ Village Scribe Association	Founder and CEO
12	Reed House Systems	Software Developer
13		Software Developer
14		Senior Software Architect
15	SAFIPA	Chief Technical Advisor
16	Telkom	Manager of the CoE's
17	Tellabs	CEO of the African/ Middle East Section
18	SAAB Grintek	Head of Business Development
19	Amatole Telecommunications (Easttel)	Consultant
	GOVERNMENT	
20	Meraka Institute CSIR	Living Labs Research Group Leader
21		Living Labs Network Coordinator
22	THRIP	Project Manager
23	Department of Science and Technology	Chief Director - International Resources
	COMMUNITY	
24	Ngwane School	Former computer course student
25	Ngwane School, living in Govan Mbeki Township, iDutywa	Teacher

4.2.3 Data analysis

Data analysis was conducted in two main stages, an informal stage and a formal stage. The informal stage began during interviews where key points were recorded on the interview guide. Memos containing reflections, ideas and observations were also recorded throughout and after the data collection period of this section of the project. For example, memos were recorded during the interviews, directly after the interviews and after revisiting interview notes and transcripts. In the spirit of the action research philosophy, important reservations and suggestions mentioned

by the interviewees and memos written by the researcher were reported to the appropriate people in the Siyakhula Living Lab team in meetings or conversations. This was done with the intention of affecting positive change within the project throughout the research process.

The majority of the data analysis was conducted during the formal stage. Following the transcription and cleaning of the interview transcripts, the formal stage of data analysis involved the responses being coded and assessed for patterns or themes (Coffey & Atkinson 1996). Every unique response was coded which resulted in more responses than the number of stakeholders interviewed where participants gave more than one answer. For example 24 of the 25 participants listed more than one potential benefit of the Siyakhula Living Lab resulting in a total of 88 responses. The data was then arranged into categories and groups where appropriate.

4.2.4 Ethics

Prior to conducting the interviews, stakeholders were given an information and consent form and revocation of consent form to examine and complete. The research instruments used for the stakeholder interviews were submitted to the Rhodes University Human Research Ethics Committee for review and approval was granted before the study took place. This research was also covered by the UTS IDHuP generic ethics clearance. Findings from the study are presented next in Section 4.3.

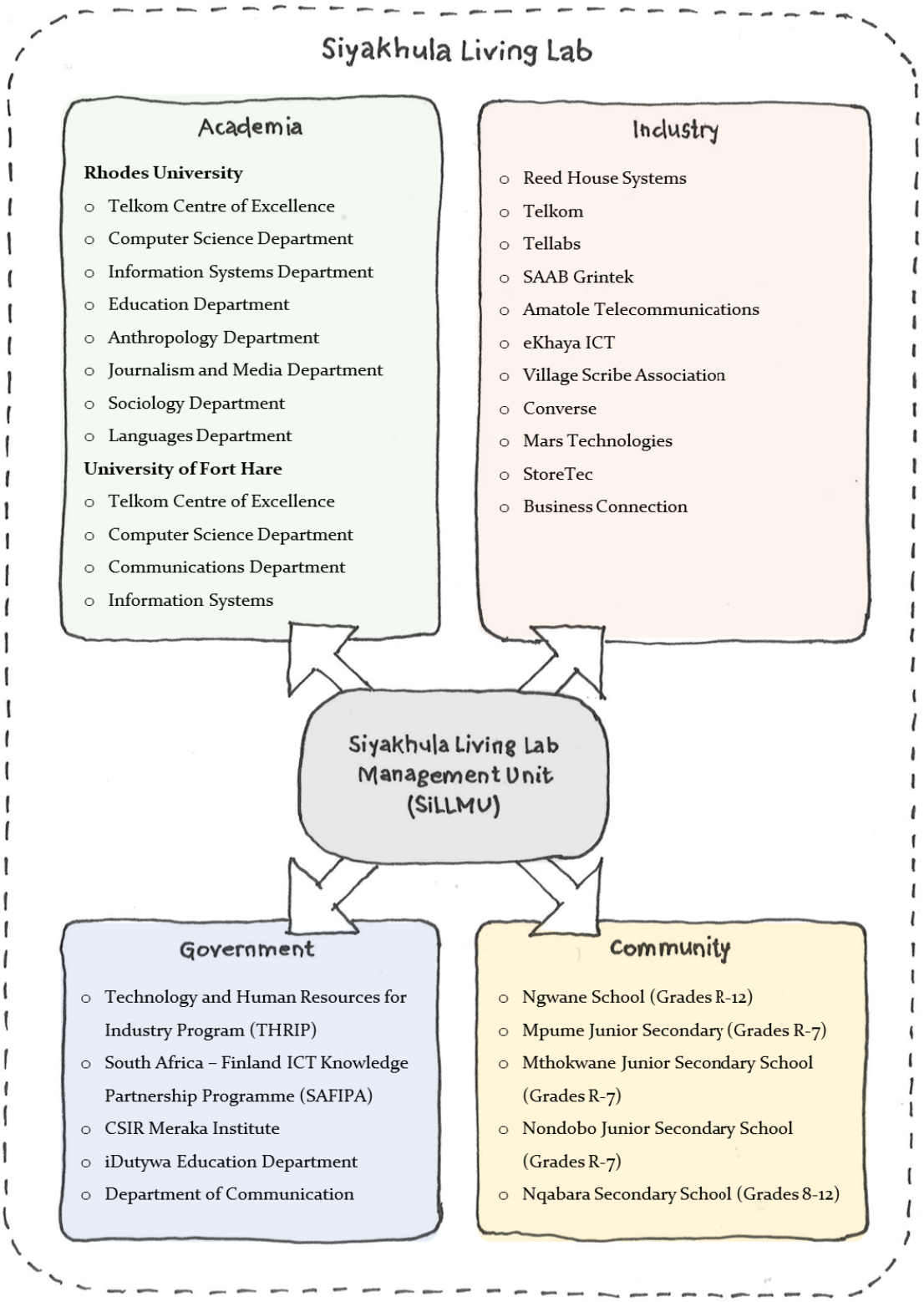
4.3 Findings

This section begins with a map of the stakeholder ecosystem of the Siyakhula Living Lab as identified in the stakeholder interviews. This is followed by a presentation of the stakeholders' agendas, visions for the project, perceived benefits, reservations and success criteria. Finally, insights into why community members are not more involved in the Siyakhula Living Lab and suggestions for how to better engage them as expressed by the two community members interviewed are described. A selection of quotes are used throughout Section 4.3 that help to further illustrate key findings.

4.3.1 Siyakhula Living Lab stakeholder ecosystem

The structure of the Siyakhula Living Lab is complex, continually evolving and spans across several domains and disciplines. At the time, a detailed map of the stakeholder ecosystem had not been created and was therefore something that was considered useful to the project. In addition, it was useful for me to be able to determine where my contribution could be made and who should be involved. Figure 10 illustrates the key stakeholder groups and how they related to each other within the Siyakhula Living Lab from mid-2010 to late 2011.

Figure 10 Siyakhula Living Lab stakeholder ecosystem 2010-2011



* Reed House Systems is a start-up launched by the Siyakhula Living Lab

The large number and range of stakeholders involved captured in Figure 7 above, allows for a visual appreciation of the size and complexity of the project.

4.3.2 Stakeholder agendas

In order to assess the agendas of the different stakeholders, participants were asked what they personally hoped to gain, and what their organisation hoped to gain from their involvement with the Siyakhula Living Lab. Each participant gave between one and six responses to form a total of 76 responses. These were grouped together where appropriate to form 29 unique response categories. The unique response categories were then divided into three groups depending on if the agenda was in the interest of the community, the organisation the participant was representing or personally focussed. The unique response categories and the corresponding number of people are presented in Table 10 under their respective group heading.

Table 10 Stakeholder agendas according to area of focus

Community focus
Skills and development within the community (8)
Access to information, opportunities and connections to the world (6)
Enhance peoples lives (6)
Jobs in the area (3)
Ownership and involvement of the community in project (3)
Computer literacy amongst teachers and community members (1)

Organisation focus
Recognition and potential marketing tool (7)
Better research and publications (5)
Better students/ high quality graduates (4)
Money/ profit for organisation (4)
Community engagement (4)
Linkages and collaboration (4)
Growth of Siyakhula Living Lab ecosystem/ expansion to other communities (3)
Siyakhula Living Lab to become more sustainable (2)
Human capital/ identifying potential candidates (2)
Experience dealing with a customer (1)
Experience working in rural areas (1)
Products or arterfacts (1)
Success stories coming out of Siyakhula Living Lab (1)
Science and technology has a role to play in socioeconomic opportunity (1)
An area of expansion for organisation (1)
Reed House Systems to evolve into an actual company (1)
Working model (1)
Companies software deployed in rural communities (1)

Personal focus
Feeling of contributing to improving lives (1)
Promoting peace, cultural awareness and understanding (1)
South Africa to be a large contributer to research and development globally (1)
Intellectually supervising people in the field (1)
Experience being a solutions architect (1)

Over half of the responses captured in the interview (44 out of 76) were organisation focussed, around a third (27 of 76) were community focussed. Only five of the 76 responses were personally focussed despite one of the questions explicitly asking what stakeholders personally hoped to see come out of the project or gain from it. One potential reason for the limited number of personally focussed responses was that for the majority of stakeholders interviewed, involvement with the Siyakhula Living Lab was part of their job role – whether it be for industry, government or academia. This would also help explain why over half of the responses were organisation focussed.

Stakeholders generally expected that involvement in the project would deliver benefits to their organisations. This is represented by the large number of organisation focussed responses and exemplified clearly in the following quote from an industry stakeholder:

> *"...any individual that's saying, "Oh, well you need to think of the community", but he's losing money... he'll never be able to sustain it. We have to make money in order to continue this for the next 10-15 years." (Industry stakeholder)*

Organisation focussed responses not only formed the majority of responses given, but they covered a wide range of areas. The 18 categories of responses identified are listed above in Table 10.

The most common response in this category was that stakeholders hoped to be able to use their involvement in the Siyakhula Living Lab for recognition and as a potential marketing tool. The wide range of responses included things like hoping the Siyakhula Living Lab would help them recruit people to work in their organisation, through to more straightforward desires, such as the company hoping to gain experience working in rural areas.

Community focussed responses were less varied and focussed on the development of skills and opportunities for community members. The two members of the community interviewed both emphasised that people in the community were

hoping to not only develop their skills, but that there would be job opportunities created in the area as a result of the project, as reflected in the statement:

> *"There are some who are really keen to learn more on the computers and I'm sure there are some who are expecting or hoping that there will be jobs coming from it, probably from the project... because I think the main purpose – well, one of the main purposes was that people do not have to go to the towns, to the big cities to get jobs. They train there and then they get jobs there, they don't have to move. So if maybe there will be some kind of organisation that could work with the project to offer people some jobs after they finish their training. I think that would be a nice thing." (Community member)*

The five personally focussed responses were all different and included wanting the feeling of contributing to improving lives and the desire to see South Africa as a large contributor to research and development globally.

4.3.3 Stakeholder visions for the Siyakhula Living Lab

When stakeholders were asked about their vision for the project, the majority of participants (23 out of 25) stated one vision, and two participants stated two and two participants did not provide any visions resulting in a total of 25 responses. The 25 responses to this question were grouped into 7 categories that are presented in Table 11.

Table 11 Stakeholder visions for the Siyakhula Living Lab

Visions
For Siyakhula Living Lab to grow and expand to other communities* (8)
Development and empowering communities* (7)
Access to information and services locally (4)
Create a working ICT4D model (2)
Development of a useable and useful product (2)
Sustainable jobs in the region (1)
Carry on the good work they're doing (1)

*quote provided from this category below

The majority (19 of 25) of visions are captured in the top three categories displayed in Table 11. Quotes from these three categories are provided to illustrate these visions. Approximately a third (8 of 25) of participants interviewed wanted to see the Siyakhula Living Lab grow and expand to other communities:

> *"...being able to grow as the name says and replicate, that's the important thing because for me there's still many communities like the Siyakhula Living Lab that would like to see such projects being moved to their areas ... I mean we chat to some of these people when we go to events and half the time they say 'oh yeah, we're in the Dwesa/ Nkwalini area' and the first thing that they ask you is, 'when are you guys extending?'. Not only like around the Dwesa/ Nkwalini areas, you have people maybe from the province and from around South Africa that kind of ask when you are extending towards them. So for me, really it is that ability to have the Siyakhula Living Lab move beyond the borders of Dwesa/ Nkwalini, that's what's really important." (Siyakhula Living Lab team member)*

The second most common (7 of 25) vision held by the stakeholders was that Siyakhula Living Lab would contribute to the development and empowerment of the communities:

> *"I see the project developing our community, Ngwane community. People who are just staying around houses must be able to develop their skills to do something in the computer. To know the value of the computer. To know that the computer can assist them on getting some jobs on internet, on having skills to advertise their products in the internet." (Community member)*

Finally access to information and services locally was a vision expressed by four stakeholders:

> *"...have children in Dwesa having access to relevant information and being able to understand what relevant information is. Participating and producing content, ideas that go into what they call the Global Village, so that they're able to tap web pages, blogs, find out things that are interesting for them etcetera, build things there, become active, adapt, ideas, things, ways of doing things, understanding things better, and remaining there." (Academic stakeholder)*

4.3.4 Perceived benefits of the Siyakhula Living Lab

Stakeholders were asked what they thought were the potential benefits and problems that could be solved by the Siyakhula Living Lab. They each listed between one and eight benefits resulting in a total of 88 benefits. These were grouped together where appropriate to form 24 unique response categories. The responses categories were then divided into two broad groups depending on whether the benefit was community or organisation focussed. Of the 24 unique response categories, 14 categories were community focussed and 10 categories were organisation focussed. These are captured below in Table 12.

Table 12 Perceived benefits of the Siyakhula Living Lab

Community focus
Improved education and ICT literacy* (11)
Access to knowledge and information* (8)
Connection to the rest of the world* (7)
Empowerment (7)
Jobs (6)
Community development (5)
Access to new markets (5)
Access to services (5)
Infrastructure e.g. computers and internet (4)
Open innovation environment (1)
Technology solutions tailored to community (1)
Other activities made possible (1)
A sense someone is taking care of them (1)
Increase and enhance communication trends (1)
Hope (1)

Organisation focus
A working model for service provision* (6)
Research space and opportunities (5)
Publications and associated subsidies (3)
Corporate social investment (2)
Human capital/ identifying potential candidates (2)
Take South African perspective internationally (1)
Potential for a new market (1)
Government to understand what's happening in rural communities (1)
Government to save money through e-Service provision (1)
Project leads to other projects coming to fruition (1)
Support a stronger link between Rhodes and Fort Hare Universities (1)

*quote provided from this category below

The large majority of benefits identified by stakeholders (64 out of 88) were community focussed benefits, which is in line with the projects' goal of delivering a benefit to the Dwesa communities. Quotes that illustrate four of the most commonly cited benefits are presented below.

The most commonly cited benefit (11 of 88) was the community focussed benefit of improved education and ICT literacy:

> *"Well, it's clearly ICT training. Improved schooling. We've had in Nkwalini and at Dwesa kids that have been left in the area rather than being taken up and sent to a boarding school because the parents have more confidence in the schools. The teachers are happier to come to school because there is internet there." (Siyakhula Living Lab team member)*

Access to knowledge and information was the next most commonly cited benefit (8 of 88):

> *"Now, once telecommunication was really just to reduce the movement – still a very important thing – but limited to either being fed information on a television or being able to make phone calls, normally at high cost. Now telecommunication through the arrival of the internet – thank God – has really changed the game. It's an avalanche of information at an incredibly low cost that is available to you. So starting this process of having people become more aware that they can transform themselves and the situation around just through taking time in picking up knowledge." (Academic stakeholder)*

The Siyakhula Living Lab connecting the community to the rest of the world comprised 7 of the 88 responses:

> *"..there is what you could call the researcher's paradox if you want. And that's really the first thing that comes to my mind. I'm not saying it's the most important effect but there is a very real and concrete effect that comes from the bare fact of being researched, that the research is taking place. So there is involvement, there is involvement by the university, there is presence, and that brings about a response by the community. There is a sense that they are connected to the outside world, that there is an interest in them in what they're doing, and particularly because of the philosophy that the project Siyakhula Living Lab has had from the beginning, there is a very clear interest in the community's participation and productive involvement.*
>
> *So I would say that irrespective of what you can actually observe as a measurable effect on the ground, in my mind that is definitely, this very important aspect. The fact that because there is the project there, there is a sense of participation, of novelty, of things happening of importance as well of the community there." (Academic stakeholder)*

The most common organisational focussed benefit identified (6 of 88) was that the Siyakhula Living Lab could contribute to a working model for service provision:

> *"...this type of project can certainly have a business spin off for companies being involved in the sense that, what's being done in the Living Lab, what's being done to Dwesa ...the success of this project can certainly be duplicated throughout the rest of the country and even in the rest of developing countries throughout the world. And the spin off for companies being involved in this type of project is that they can then adopt this model that's being implemented to further their business in other rural areas." (Industry stakeholder)*

4.3.5 Reservations about the Siyakhula Living Lab

Stakeholders were asked if they had any reservations about the project and what they considered to be risks to the project's success. 24 out of 25 participants answered this question stating between one and four reservations or risks each. The 42 responses from the stakeholders varied widely and were grouped together to form the 21 unique response categories presented in Table 13.

Table 13 Reservations about the Siyakhula Living Lab

Reservations
Sustainability* (7)
Buy-in from the community* (4)
Key researchers and community members disappearing (3)
Student's relationship with community members* (2)
Maintenance and support (2)
Complexity of the project (2)
Cultural factors* (2)
Better inclusion of disciplinary perspectives in project (i.e. not just computer science) (2)
Difficult work environment (2)
Technical risks and challenges (2)
Theft of equipment (2)
Students making false promises (2)
Funding (2)
Access to Living Lab facilites by community* (1)
Working with communites intesely time consuming (1)
Research burn-out/ fatigue from the community (1)
Technology made available at the right cost point (1)
Distance between project team and community (1)
Most researchers don't speak local language fluently (1)
Stays in academic context (1)
Local infrastructure to support labs (1)

*quote provided from this category below

By far the most commonly cited reservation was the sustainability of the Siyakhula Living Lab accounting for 7 of the 42 responses:

> *"...having these kinds of projects made into a sustainable type of thing where they don't fall flat after a few years, because we know so many projects through computers and ICT, stuff has been installed and then within the month or five it's all basically not functioning and the computers have disappeared and stuff like that. So I think there are question's around sustainability that obviously would require careful attention." (Academic stakeholder)*

The second most common reservation given by stakeholders (4 of 42) was a concern about buy-in from the community:

> *"...it's not easy to get the community to understand exactly what we are trying to do. Their buy in is difficult to win." (Siyakhula Living Lab project member)*

The reservations and risks expressed by stakeholders highlighted several risks to the Siyakhula Living Lab project as well as challenges working with the Siyakhula Living Lab communities. The risks and reservations identified, provided valuable insight for the Siyakhula Living Lab management on not only current risks and challenges, but potential future risks to be aware of. Three examples, a current risk, future risk and project challenge that illustrate this point are provided under their respective headings.

Current risk: Students attitudes and how they are perceived by communities

> *"...the risk is the students who just comes in and out to do their degrees and without really seeing... without the community understanding the benefit that they can get from these students. It feels... it can feel to the community sometimes that the students are only using them for information to get a degree." (Government stakeholder)*

Future risk: Technology monopolised by local elites

> *"One possible challenge is access for the learners and for the members of the community at large. I think there is a very serious thing that technology, like any type of information which is high status, becomes monopolised by local elites and in this particular instance we're talking about teachers, because they are an elite within that context. One can see teachers were the first ones to come to take it up, to become involved, there is this course running etcetera. This can be either the initial phase of the diffusion of an innovation according to the classical diffusion of innovation theory but can also be a step in the building of an elite that sort of controls the access to that technology. And I think that's a place where we don't want to go. So the important thing is to bear in mind who the teachers are in that community, what is their role and capitalise on that as agents of innovation that make it trickle down to everybody else not as gatekeepers. And this is going to be an important thing." (Academic stakeholder)*

Project challenge: Communication and cultural factors

> *"...I struggle a lot to put myself in their position because I don't know how to not understand what I already know. So in a sense you're explaining it more clearly and then you realise a week later that you clearly weren't, because the same silly thing happens again after you left. And it's really frustrating 'cause I'll spend a week and I'll get everything working perfectly and I'll just think, "please just use them the way you're supposed to, don't do anything weird" and I'll be gone for three days and it'll all be broken again and I don't know what goes on! You know I'm not there and they can't tell me what happened because to them it's just this random sequence of events. They have no idea what happened. They're just convinced that it only works when I'm there. And you know, it doesn't have to be like that, but I don't know how to change it because I don't know what they're doing and they don't know what they're doing either. So it's difficult... and very frustrating." (Siyakhula Living Lab team member)*

4.3.6 Success criteria

To identify stakeholders' success criteria, participants were asked what criteria the project would need to meet in order to be considered successful. As the project had been in progress for several years prior to the interview, some stakeholders not only shared success criteria that could be met in the future, but shared criteria and examples that supported why they considered the Siyakhula Living Lab to already be a success.

The 25 participants each gave between one and five responses to this question. Of the 59 responses, 50 were future success criteria and nine were criteria that supported the Siyakhula Living Lab was already a success. These criteria are presented in two separate tables, Table 14 and Table 15. The 50 success criteria shared by stakeholders were arranged into 22 unique response categories and divided into two groups. These groups were community related criteria and

organisation related criteria and are presented in Table 14. The 22 success criteria identified by stakeholders were almost equally divided between community related success criteria (12 of 22) and organisation related success criteria (10 of 22).

Table 14 Success criteria

Community criteria
Adoption of lab, technology and/ or services by the community* (7)
Communities lives improved* (7)
Community inspired innovation and empowerment* (4)
Improving computer literacy in community (3)
Job creation/ income generation (2)
Sustainablity within community context (2)
Success stories coming out of the community (2)
Community expectations met (1)
Solving local problems (1)
Access to services (1)
Access to relevant information (1)
People remian in communities (1)

Organisation criteria
Siyakhula Living Lab model/ technology created used in other communities* (7)
Number of postgraduate students produced by the university (2)
Number of publications (2)
Technolgy works (1)
Sustainable high level IT jobs in Eastern Cape (1)
Continue to be a low cost exercise (1)
Level of tele-density in area (1)
Community used as testbed by government and companies (1)
Project milestones met (1)
Needs identified in baseline study met (1)

*quote provided from this category below

A selection of quotes that detail the four most common success criteria identified by stakeholders are included below.

Seven participants felt that the lab, technology and services being adopted and used by community were a criteria it would need to fill in order for them to consider the Siyakhula Living Lab a success, for example:

> *"It's fine if we build a big old telecommunication network and it runs beautifully but if nobody wants to use it, so what? And it's fine if we develop a whole lot of services, but if nobody wants to use them, so what? And it's great if we've got computers in every single school and interactive white boards and blah, blah, blah, but if nobody uses them, so what?" (Academic stakeholder)*

An equal number of participants felt that evidence of success would be found if the Siyakhula Living Lab model or technology were to be used in other contexts:

> *"...I would like to see it grow and become bigger, sort of initiative that benefits most people and it might also have to grow to be supported by Government in a more intense way where it benefits more and more people. Because computer technology's very much applicable to most of the communities, but the rural communities don't have access to that information. So I think for me really it should just be that we put more effort in insuring that it grows." (Government stakeholder)*

Another commonly cited success criteria was that the community members' lives be improved in some way:

> *"Well the main area of success that I would like to see or how we determine the success is how many lives have been changed in a positive way. Not necessarily how many people have been exposed to the technology, but the main criteria would be for me to say: at the end of the day, in Dwesa there was, as an example, there's 50 children living here and at the end of the day, because of the lab, all 50 children know what is means to sit behind a computer. All 50 children can walk away with a certificate to say, "We are computer literate" be it something basic like your ICT training or just a simple introduction to computers, but that will be one of the areas that I would certainly look at." (Industry stakeholder)*

The fourth most common success criteria mentioned by stakeholders was that the community be empowered to help themselves and innovate:

> *"One of the main measures of success would be the community spontaneously doing things to improve their situation, innovative things. So if some guy suddenly has an invention and drums up a whole lot of support in the community, and they all sit around and work on this one thing and it's great – they can sell it on the internet, or it solves one of their health or food problems or it improves their lives in some ways, and they did it themselves, even if they only researched a tiny part of it on the internet, or even if they had nothing to do with the internet at all, I would see that really as a success. It wouldn't even need to be a technological thing, just if it were something that they chose to share with the Siyakhula Living Lab and say, look, this is a success of the Siyakhula Living Lab, then we'd see that as a success. That's a strong success factor, that's probably the strongest one." (Industry stakeholder)*

Five of the 25 stakeholders interviewed expressed that they already considered the Siyakhula Living Lab to be a success. Four stakeholders listed between one and four unique success criteria that they indicated were evidence of the Siyakhula Living Lab already being a success in some way resulting in a total of nine unique criteria. These criteria are presented in Table 15. The fifth stakeholder that felt the Siyakhula Living Lab was already a success simply stated that they felt it was already successful without listing any criteria to support their claim.

Table 15 Evidence of current success

Success criteria
The project is still around after several years (1)
Good relationship between project and community (1)
Two very different universties interacting closely (1)
Involved in a lot of possibilies (1)
Changed perception of what ICT research can be within University Department (1)
Still able to publish and market ourselves (1)
Teachers who were trained in computer literacy by Siyakhula Living Lab now training others in community (1)
Ngwane school pass rates improved since internet introduced there (1)
The establishment of Reed House Systems (1)

The criteria mentioned as evidence that the Siyakhula Living Lab was already successful varied widely as can be seen in Table 15. It included relatively simple criteria such as the fact that the project is still around after several years, functional criteria such as having a privileged and disadvantaged university working closely together, to tangible criteria such as pass rates improving at one of the community schools.

4.3.7 Community insights

The two members of the community interviewed offered insights into barriers to involvement in the Siyakhula Living Lab as well as strategies to involve community members more closely. Four primary barriers described by the community stakeholders are listed below with a quote that can illustrate the barrier.

Barrier one: Failed to see relevance for them

> *"There are a lot of people, like youth staying there, who are not going to the training because they just don't think that it's going to help them"*

Barrier two: Lack of confidence

> *"The ones that are there, some of them did not finish even Matric or something, so they don't feel confident to go and use the computers."*

Barrier three: Language barriers

> *"…they cannot stand the fact that they go there and then there's all these people speaking English, they don't understand much. Like, the people who are training there cannot speak their language, so they feel a bit ashamed."*

Barrier four: Felt like it was only for the schools

> *"I'm sure they think Siyakhula Living Lab is for the school. Not for them. They hear all that, but we have done launches telling them that Siyakhula Living Lab is not for the school only, it's for the community, but that is not enough."*

As previously mentioned, in addition to describing some of the reasons why community members were not more involved in the Siyakhula Living Lab, both community members provided several recommendations for approaches or strategies that could be used to inspire broader community participation and involvement in the Siyakhula Living Lab. These suggestions included:

- Request permission from the Chief to approach households,
- Call a large community meeting,
- Ask the Chief to select five members of the community to be responsible for the Labs,
- Ask the people to select five members of the community to be responsible for the Labs themselves, and
- Approach people who have not and do not attend the computer training and find out why.

4.4 Discussion of findings

The study of stakeholder perspectives in the Siyakhula Living Lab provided a number of insights into the project, people and organisations involved. Potential opportunities, risks and some of the gaps in the project were also revealed. Findings from this study and their potential implications for the Siyakhula Living Lab, as well as limitations of the study, are discussed in this section under their respective headings below. A discussion of the benefits of conducting stakeholder interviews based on this study that may be applicable to other ICT4D projects will be addressed after this in Section 4.5.

4.4.1 Siyakhula Living Lab stakeholder ecosystem

Visually representing the stakeholder ecosystem of the Siyakhula Living Lab, including the major stakeholder groups involved and how they relate to each other, highlighted the number of people invested and involved in the project as well as how complex the project structure is. This was a useful activity not only for existing stakeholders so they may understand who else is involved, but for new additions to the project. However, to maximise the usefulness of this figure, there is a need for it to be diligently updated and maintained. As the project is dynamic and constantly changing, by the end of the stakeholder investigation the structure had already changed.

4.4.2 Expectations and agendas

The constantly changing size of the Siyakhula Living Lab, which included frequent recruitment of new stakeholders and the attrition of others, made it important to periodically capture stakeholder agendas. The large number of response categories identified in the stakeholder interviews highlighted how varied and broad people's expectations and agendas could be. As the number of stakeholders involved and variation of expectations increased, the chances of potential conflict and dissatisfaction also increased.

The awareness of stakeholders' agendas can inform project teams of when management of stakeholder expectations is required. For example if the Siyakhula Living Lab project team were aware that some of their stakeholders expected the

Siyakhula Living Lab to make a profit, they could ensure that these stakeholders were informed that the Siyakhula Living Lab was unlikely to make a profit in the short term and may never do so to help manage unrealistic expectations and prevent disappointment. If this were a frequent misconception, the Siyakhula Living Lab could bring this to the attention of new or potential stakeholders to manage their expectations too. Another example could be knowing community members may expect jobs to result from the Siyakhula Living Lab, the project team could explicitly let community members know that this was not a guaranteed outcome to prevent disappointment or community members feeling misled.

The awareness of stakeholder agendas can also contribute to an increased likelihood of fulfilling these expectations by informing Siyakhula Living Lab strategic priorities. For example, understanding the most commonly cited organisation-focussed response was that involvement with the Siyakhula Living Lab could be used for recognition and a potential marketing tool, highlights the importance of exposure for Siyakhula Living Lab stakeholders. This could influence decisions by the Siyakhula Living Lab team to do things such as making sure participating organisations' logos appear on the Siyakhula Living Lab website, or on banners at conferences.

The strong emphasis on organisation focussed agendas cited by stakeholders served as a reminder to the Siyakhula Living Lab that organisations involved will usually have expectations of some gain or benefit to their organisation. Explicitly capturing these agendas provided the Siyakhula Living Lab with the specific expectations of the stakeholders involved. This then allowed strategies to be devised by the team for meeting the known expectations thereby increasing the chances of maintaining good relationships with organisations and groups involved.

The significant emphasis on organisationally focussed agendas also highlights that even in projects where there is a clear focus on contributing benefit to a community, the only way of ensuring adequate representation of the interests of the community is to capture their perspectives directly. While this may seem obvious, in ICT4D projects this is often particularly challenging partly owing to

difficulties accessing members of the community, cultural and language barriers, as well as the top down approach commonly used.

4.4.3 Stakeholder visions

Interestingly, the majority of visions (19 of 25) described by stakeholders were captured in three categories, 1: for the Siyakhula Living Lab to grow and expand to other communities, 2: development and empowering communities, and 3: access to information and services locally. This demonstrates that there is a relatively focussed vision for the Siyakhula Living Lab shared by stakeholders. The focus supports that despite the wide variety of agendas, stakeholders had a relatively unified vision for the project.

The visions expressed by participants in the study could be used by the Siyakhula Living Lab team to influence project decisions relating to directions to take and what to invest resources in. For example, knowing that the most commonly held vision is for the Siyakhula Living Lab to grow and expand to other communities may influence the Siyakhula Living Lab to accommodate the expansion of the Siyakhula Living Lab into its project plan and timeline, or prioritise this if it was already part of the plan.

4.4.4 Benefits

A long list of both community focussed and organisation focussed benefits were captured in the stakeholder interviews. Examples of how these benefits could be used include: a marketing tool to promote the project and to raise its profile, to encourage investment in the project by Government or other organisations, and to be put in a project prospectus for current and future organisations involved.

The wide variety of benefits listed emphasised the significant potential of the Siyakhula Living Lab and the broad nature of the potential benefits that extend beyond community benefits to benefits for organisations involved. These include publications, a potential new market for an organisation's products, a tool that could be used by Government to provide e-Services, and to promote stronger linkages between a previously privileged and disadvantaged university.

4.4.5 Reservations

Stakeholders were asked what reservations and risks they perceived to be in the Siyakhula Living Lab project. This was intended to capture and anticipate problems, challenges and risks to the project success. Despite participants listing significantly more benefits than reservations in the Siyakhula Living Lab, they still cited a large number of reservations. The reservations identified served as warnings and highlighted potential risks to the project that could affect the Siyakhula Living Lab's chances of succeeding that the team may not have been aware of. For example, the risk of how Siyakhula Living Lab research students are perceived by the community and how they interact with the community could be managed by the project team taking into consideration students' attitudes, not just capabilities, when selecting them for involvement in the project. The Siyakhula Living Lab could also arrange to put them through an induction process to prepare them for their relationship with the community. In addition, they could make sure that students are aware that building relationships with community members may take a significant amount of time.

Another example includes the potential risk of the Siyakhula Living Lab technology being monopolised by local elites. Being aware of the formal and informal cultural hierarchies is useful for the Siyakhula Living Lab project team to inform strategies to ensure that their technology, which is intended to provide opportunity and empowerment for the whole community, doesn't inadvertently increase the level of inequality.

Asking stakeholders about their reservations also provided insight into the project team's challenges working with communities as shown in the final quote in Section 4.3.5 from a Siyakhula Living Lab member expressing their frustration with the lack of mutual understanding between them and community members when things break. Being aware of how difficult working on projects can be for the Siyakhula Living Lab team could provide incentive for the Siyakhula Living Lab management to come up with strategies to better support the team, for example, by having cultural workshops or counselling sessions available to them.

4.4.6 Success criteria

Stakeholders were asked to list the criteria that the Siyakhula Living Lab would need to fulfil in order to be considered successful with the acknowledgement that success is generally operationalised differently by different people and organisations. Knowing how success was defined by the stakeholders involved in the Siyakhula Living Lab provided the Siyakhula Living Lab management with criteria that could be incorporated into future evaluations and provided information that could be used to inform the project direction and priorities. The emphasis on success criteria cited by participants was on community related criteria such as 'community members' lives improved' and 'solving local problems'. However the significant amount of organisation focussed criteria such as 'number of publications' and 'level of tele-density in the area' serve as a reminder of organisations expectations of benefit from their involvement.

In addition, when stakeholders were asked to list their success criteria, interestingly, five stakeholders expressed that they perceived the Siyakhula Living Lab to already be a success. The fact that a number of stakeholders already considered the Siyakhula Living Lab highlights that the timescales of success criteria exists on a continuum. It also supports the case for ongoing evaluation throughout the lifetime of a project, in particular for large, long-term projects, to be able to capture not only *expectations* around success criteria, but to be able to capture where success criteria have *already been met*. The success criteria cited by participants as already being fulfilled in the stakeholder interviews conducted within the Siyakhula Living Lab could be used for promotional and marketing purposes. It also provides a case for asking participants if they consider the Siyakhula Living Lab to already be successful and why in future interviews.

4.4.7 Community insights

Even though understanding community insights was not an explicit objective of the stakeholder interviews, many useful insights were gained from the interviews with the two community members. The insights gained supports the inclusion of community members in the stakeholder interviews despite the method not being culturally tailored.

The two interviews in this study provided insights into barriers for involvement in the Siyakhula Living Lab by the community, as well as suggestions for how to involve them better as outlined earlier in Section 4.3.7. The value of the insights gathered from the two community members also supports greater involvement of community members in future interviews, in addition to culturally tailored activities, to capture their perspectives as unsurprisingly, there were unique insights that were not anticipated by other stakeholder groups.

4.4.8 Limitations of the study

There were two primary limitations of the stakeholder interview study beyond standard limitations that apply to any qualitative study, (such as the subjectiveness of the analysis process, presentation of results and reporting of what is considered significant).

The biggest limitation was the minimal inclusion of community members. Even though this was intentional due to the lack of perceived appropriateness of the tool for the context as mentioned in Section 4.2, it never-the-less resulted in an unequal representation of perspectives. In addition, although the original intention was to capture community members' perspectives using a culturally-tailored method, the evolving research priorities meant this did not happen.

The other significant limitation was how quickly things like the Siyakhula Living Lab project structure became outdated. The dynamic nature of the Siyakhula Living Lab project meant that during the study several stakeholders interviewed left their organisation or changed positions. This changed things like the weighting placed on various success criteria and expectations.

4.5 Discussion of the benefits of stakeholder interviews

The stakeholder interviews were useful for more than the insights they revealed. They were also useful for a number of other reasons, both for my research and potentially for other ICT4D projects more generally. The additional value of conducting stakeholder interviews experienced in this research are described below under nine broad categories and summarised in Table 16.

Table 16 Stakeholder interview values

	Values	Description
1	**Something to do**	Legitimate activity within project context while scoping potential contribution and developing relationships
2	**Relationship building**	Starting point for dialogue and relationship building with project members and stakeholders
3	**From 'outsider' to 'insider'**	Transition from project 'outsider' to part of the team (i.e. 'insider') enables a legitimate voice within the project context
4	**Identifying supporters**	Opportunity to gather together a group of like-minded people to support an intervention to allow change
5	**Collecting supporting evidence**	Objective evidence to support changes that need to take place within the project and identify areas where caution needs to be exercised
6	**Informing methods**	Informing the use and creation of methods used for the rest of the research based on understading the project context
7	**Informing the team**	Providing new and existing members of the project team current information about the project, the key stakeholders involved, expectations, reservations and visions
8	**Future project directions**	Informing future project activites and initiatives based on suggestions, ideas or issues raised during interviews
9	**Marketing and publicity material**	Benefits of the project, stakholders' visions for the project and evidence of success could be used for publicity, marketing and encouraging new partnerships

An expanded discussion of the values in Table 16 is provided under their respective headings below.

4.5.1 Something to do

After establishing that I would contribute to the Siyakhula Living Lab, the first task was to familiarise myself with the project team and context. It was important to me that there was a complimentary match between my skills, the needs of the project, and my PhD requirements. In order to find this intersection, I needed to understand the project, its context and the people involved in the Siyakhula Living Lab. This required spending time with researchers at the university and field trips to the project sites.

Conducting stakeholder interviews provided me with a legitimate activity within the project context while scoping potential contributions, building relationships (detailed next in 4.5.2) and familiarizing myself with the project, cultural and social context. The Siyakhula Living Lab was a large collaborative project with

many stakeholders and primarily working with marginalised communities. The combination of the large number of stakeholders and working with marginalised communities, contributed to things often not going according to plan. The exploratory nature of my research and participatory action research approach, also made it challenging to be specific about my research direction, especially in the early stages of my research.

Conducting the stakeholder interviews was a discrete activity that I could take ownership of that could be relatively well planned and controlled. It was also a structured activity that helped justify the significant amount of time I was spending in South Africa to my university in Australia, as well as an activity that would definitely lead to some sort of research findings for my thesis.

4.5.2 Scaffolding for relationship building

A common challenge when joining a large, multi-disciplinary, multi-organisational research project is establishing relationships with those involved in the project. This is particularly the case in projects such as the Siyakhula Living Lab which had project members and participants in several different locations and across many different organisations. This challenge is also further enhanced when you are not local or familiar with the project location.

The stakeholder interviews provided a legitimate reason to engage with key stakeholders involved in the Siyakhula Living Lab which in turn became a starting point for forming relationships. The stakeholder interviews and informal conversation surrounding the interviews, provided a platform for dialogue, relationship building and facilitated me becoming known in the project. While this may have happened in the project with some stakeholders eventually, the stakeholder interviews opened the doorway to a wider range of stakeholders and provided a natural starting point for discussion.

4.5.3 Facilitate transition from ‘outsider’ to ‘insider’

The combination of conducting stakeholder interviews and spending significant time in the research context facilitated the transition from my original position as

an ‘outsider’ to the Siyakhula Living Lab, to someone who was considered part of the team, (an ‘insider’). The transition from ‘outsider’ to ‘insider’ applied to both my relationship with the Siyakhula Living Lab, and being a resident of Grahamstown. That is, they helped me to settle into South Africa, which was previously an unfamiliar country, and feel like I was establishing a home there.

The transition to being an ‘insider’ in the Siyakhula Living Lab was both a result of being physically present and seen in the research environment, as well as being able to share some of the project specific insight gained during the interviews with stakeholders. This was particularly the case with the project management team, where there was regular contact and discussion of project directions and strategies. Being an ‘insider’ enabled me to have a legitimate voice influencing strategy and project directions within the Siyakhula Living Lab. It was also a key factor in enabling me to gain the support needed to realise my own original project idea within the Siyakhula Living Lab, the production of Interplay. This is discussed in Section 4.5.7: Informing future project directions. The time and work required to transition to a project ‘insider’ in this research was a reminder not to take my participation and having a legitimate voice in a project for granted. It was also a reminder that being a project ‘insider’ often needs to be earned, especially in established projects.

4.5.4 Identifying supporters

The stakeholder interviews provided the opportunity to identify and form a team of likeminded people to help build an argument for supporting an intervention or change to take place. For example, one of the limitations of the Siyakhula Living Lab identified by both myself (as interviewer) and some of the interviewee’s was the limited involvement of people from the humanities and social sciences. The stakeholder interviews served as a catalyst to form a working group of people from the humanities involved in the Siyakhula Living Lab to discuss strategies to give the humanities a larger voice in the project.

A working group made of up stakeholders from the Anthropology, Education, Information Systems, Computer Science Departments and the Siyakhula Living

Lab Management Unit Project Lead was formed. Regular meetings took place from March 2012 and continued after I left South Africa in July 2012. One of the issues discussed in the early meetings was that of ethical practice within the Siyakhula Living Lab, research approaches and the lack of transparency and awareness of projects people were working on within the Siyakhula Living Lab. As a step towards addressing these issues, a guideline of ethical practice was drafted and a full-day workshop was held on the 1st of August 2012 at the University of Fort Hare. All researchers, academics and students involved in the Siyakhula Living Lab were invited to attend the workshop which covered the aims and objectives of both the Siyakhula Living Lab and Reedhouse Systems, the computer literacy training plan for the educational programme being conducted in the Dwesa communities and the guidelines for engagement and ethical research practice within the community.

A total of 29 people attended the full day workshop. Following the workshop, documents detailing the project structure, aims and organisations involved were distributed to the project team.

4.5.5 Collecting supporting evidence

The stakeholder interviews provided objective evidence to support suggestions for changes that needed to be made within the Siyakhula Living Lab, potential areas I could contribute to, and identify areas where caution was required. That is, it provided the team of supporters mentioned in the previous section (4.5.4) and myself ground to stand on to be heard and listened to by management. For example, several interview participants mentioned that they were concerned about Siyakhula Living Lab student researchers making false promises to community members. This lead to a heightened awareness of students' conduct in the field and the need for further research ethics training and education for the students involved in the Siyakhula Living Lab. As a result, training and education of students in research ethics was one of the items scheduled in the full day workshop mentioned in Section 4.5.4.

Another example that emerged from the stakeholder interviews was the need for more close engagement with members of the community by the Siyakhula Living

Lab project team and suggestions for how this may be achieved. This finding lead to prioritising the Siyakhula Living Lab project teams' engagement with community members planned through active discussions around strategies and times for this engagement to take place.

4.5.6 Informing methods

Spending time in the research environment, partly made possible by conducting the stakeholder interviews, and gathering suggestions shared by interview participants, highlighted the cultural gap between my western socialisation and the project's cultural context. It provided support for the importance of not simply transferring western-derived design methods into this non-western context without first reflecting on whether it was appropriate to do so, or if it would be more appropriate to find methods that were better suited for the cultural context.

Critically reflecting on the choice of research methods to use in this context included the consideration of tailoring existing methods for the cultural context, as well as attempting to create new methods specifically for this cultural context. In the context of my contribution to the Siyakhula Living Lab, the process of conducting the stakeholder interviews set the foundation for the three cycles of research outlined previously in Chapter 3, and my eventual contribution of Interplay, a culturally tailored tool for engaging community members in the Siyakhula Living Lab projects and enabling community members to participate meaningfully in the design of applications (please refer to Chapter 6 for a detailed account of Interplay).

4.5.7 Informing project team and new project members

Information about the project, stakeholders involved, their roles, future possibilities, benefits, risks and success criteria were useful to both existing project team members as well as new members. This was helpful to existing project team members, as the Siyakhula Living Lab was not clearly defined, had undergone several iterations and had significantly grown over the previous six years. Therefore, existing project team members understanding of the Siyakhula Living Lab objectives were not necessarily aligned. New project team members got better

exposure to an up-to-date account of the Siyakhula Living Lab project details through the stakeholder interview findings.

As the Siyakhula Living Lab was a large project that was constantly evolving, investing in keeping the stakeholder map and list of current projects up to date could be useful to help ensure project and external stakeholder expectations were managed. Due to the relatively high turn-over of people, in part due to the size, annual or bi-annual interviews could be administered to help keep the information up to date.

4.5.8 Informing future project directions

The stakeholder interviews helped inform future project direction of the Siyakhula Living Lab in several ways. The agendas and desired roles of stakeholders were taken into account by the Siyakhula Living Lab management team and influenced the management team actively supporting the agendas and desired roles articulated by some of the stakeholders.

Information around the potential benefits, reservations, visions and success criteria were also used in a variety of ways by Siyakhula Living Lab management team. Two early examples included the stakeholder interviews being the catalyst for, 1: the formation of the Siyakhula Living Lab working group, and 2: the multi-stakeholder Siyakhula Living Lab workshop. The working group and multi-stakeholder workshop have been described earlier in Section 4.5.4 (on identifying supporters).

4.5.9 Material for marketing and publicity purposes

The benefits identified, visions shared and evidence of current success cited in the interviews could be used for marketing and publicity purposes to promote the Siyakhula Living Lab, encourage other organisations to be involved in the Siyakhula Living Lab and to support funding applications. In addition, quotes that support the importance, impact and significance of this project could be used for marketing purposes.

4.6 Future work based on stakeholder interviews

Due to the dynamic nature of the Siyakhula Living Lab project and stakeholders involved, future work within the Siyakhula Living Lab could also include administering the stakeholder interview schedule to new key stakeholders involved and repeating an adapted version of the stakeholder interview schedule every two to three years to capture changes, revised success criteria and current evidence of success.

Another area of future work could be addressing the limited inclusion of community perspectives. Despite the Siyakhula Living Lab's presence in the communities since 2005 and Rhodes University being involved with the communities in the area since the 1990's, the project has struggled to engage a broad spectrum of community participation for a variety of reasons that relate to history, culture and the project. This has been recognised as an area that requires attention. Future activities conducted in the Siyakhula Living Lab hope to capture a wider range of community perspectives and interest. Before being able to capture the community perspectives comprehensively and involve them in the Siyakhula Living Lab more inclusively, a strategy is required to engage them. To help devise this strategy an understanding of why community members are not more involved would be helpful. Future work in this area could involve following up on the suggestions provided by community members, such as requesting permission from the chief to approach households and calling a community meeting.

4.7 Summary of research cycle A

The final interviews with community stakeholders contributed to my realisation that one of my initial aims, aim 3A (design a mobile health (or other service) application for the rural Transkei as part of the Siyakhula Living Lab), would not be possible in my remaining time. This realisation lead to me revisiting my aims and research questions, and marked the end of research cycle A.

The stakeholder interviews combined with fieldwork, language lessons and consuming local media, contributed to my understanding of the cultural and

Siyakhula Living Lab project context. I also built relationships with the project team. Findings from research cycle A, particularly from the final two stakeholder interviews, significantly affected my research aims and focus in subsequent research cycles in three major ways.

- *The first* was realising the usefulness and significance of conducting stakeholder interviews within an ICT4D context. This contributed to the addition of two research questions in research cycle B on the impact and benefits of conducting stakeholder interviews.

- *The second* was discovering how relatively disengaged members of the Siyakhula Living Lab communities in the former Transkei were in the Siyakhula Living Lab project. The lack of engagement, the seven hour drive between Grahamstown and the former Transkei, as well as the challenges living there, made me realise that my initial aim to design and develop a mobile health application was a larger task than was possible in my remaining time.

- *The third* was the realisation that if I wanted to be part of the design and development of something new, I would need to focus on more local options. Following this realisation, I revisited my research plan to explore what would be possible to achieve realistically in my remaining time. Knowing the importance of the frequent face to face contact required to turn around a project in a limited time and with an interest in being practical, my first step was the explore if there were any project opportunities locally in Grahamstown. This lead me to reconnect with the Egazini Outreach Project, a talented group of artists I had met earlier in the year when my supervisor, a former artist, visited me in South Africa and expressed an interest in seeing their artwork.

The decision to engage the Egazini Outreach Project marked the beginning of research cycle B and updating my aims and corresponding research questions from aim 2A: understanding the South African context, to aim 2B: understanding the

Egazini Outreach Project context, as well as, from aim 3A: designing a mobile health application for the rural Transkei, to aim 3B: designing an e-commerce application for the Egazini Outreach Project. The focus of research cycle B, the Egazini Outreach Project, is elaborated on in Chapter 5.

5

Egazini Outreach Project

Cycle B of this research focussed on understanding the Egazini Outreach Project artists in order to design an e-commerce application to sell their artwork online.

This chapter provides the background of the Egazini Outreach Project and details the various research activities conducted with the group. Selected findings and key learnings that could be applied to other ICT4D projects are presented. Research findings relating to the Egazini Outreach Project also provide helpful context for the educational play that was produced in cycle C, the final research cycle.

Photos are included throughout this chapter of the Egazini artists and their artwork to assist painting a richer picture of their context.

Image 5: Egazini artists standing in front of the Egazini Outreach Project in 2011

The second cycle of my research began with the identification of the Egazini Outreach Project as the initial group of artists who might benefit from an e-commerce application to sell their artwork online. The Egazini Outreach Project had, at the time, been around for 10 years and achieved a level of success and recognition in this period with exhibitions being held both locally and internationally. For example, when I engaged the Egazini Outreach Project in 2011, one of the artist's, Nomathemba Thana, had her work exhibited in the 'Impressions from South Africa, 1965 to Now' at the Museum of Modern Art (MOMA) in New York (Hecker 2011). Despite this recognition, artists at the Egazini Outreach Project, also referred to as Egazini artists, struggled to sell their artwork and did not have an online presence. The limitations of the Egazini artists' understanding of the internet were clear early in the engagement with them. The recognition that this would inhibit the extent to which they could participate meaningfully in the design of an e-commerce solution, led to the conception of the culturally tailored educational play, Interplay.

Cycle B of the research was a very short research cycle as it became evident that with the amount of time needed for the production of Interplay, the design and implementation of an e-commerce solution would be beyond the scope of my engagement with the Egazini artists. Finding ways to support meaningful participation was considered a priority before other things could be done. This is what led to the final change in focus of my research to the production of an educational play. However, it was only retrospectively that I identified this transition from cycle B to cycle C after accepting that there wasn't adequate time left after producing Interplay to co-create an e-commerce application as well. The details of producing Interplay will be discussed in the next chapter.

This chapter tells the story of my engagement with the Egazini artists beginning with the background of the Egazini Outreach Project, followed by an account of my research activities with them, key research findings and the transition to cycle C, the final research cycle involving the production of Interplay. Details about the Egazini Outreach Project, including profiles of the Egazini artists, are included as they provide useful background information that helps to contextualise Interplay.

A recap of research aims and questions for cycle B is provided in Table 17 for context.

Table 17 Recap of research aims and questions for cycle B

Aim 1B: Make a positive contribution to the Siyakhula Living Lab and related communities.

Research question 1B: How can stakeholder interviews influence an ICT4D project contribution?

Research question 2B: What are the benefits of conducting stakeholder interviews in ICT4D projects?

Research question 3B: What are potential opportunities for me to contribute to the Siyakhula Living Lab?

Aim 2B: Familiarise myself with the Egazini Outreach Project context.

Research question 4B: What cultural factors need to be taken into account when identifying suitable research methods for understanding and engaging the Egazini Outreach Project artists?

Research question 5B: What are the needs, motivations and familiarity with technology of the Egazini Outreach Project artists?

Research question 6B: What is the potential role of ICTs for providing a useful service for the Egazini Outreach Project artists?

Aim 3B: Design an e-commerce application for the Egazini Outreach Project artists to sell their artwork online.

Research question 7B: What are the challenges designing technology for socioeconomically disadvantaged communities in a culturally unfamiliar context?

Research question 8B: How can methods used in participatory design be adapted to give Egazini Outreach Project artists a meaningful voice in the design of an e-commerce app to sell their artwork online?

5.1 The Egazini Outreach Project – background and current state

The Egazini Outreach Project is made up of a group of artists located in the Joza Township, Grahamstown. It originally began as a historical and fine arts endeavour to capture the Battle of Grahamstown from various perspectives. It then transformed over time to be a semi-self-sustaining arts and economic venture, which it continues to be to this day (Wells 2012). The background, development, evolution and current state is further described below.

5.1.1 Grahamstown and the Battle of Grahamstown

On the 22nd of April 1819, approximately 10,000 Xhosa warriors attacked a group of 350-450[5] soldiers in Grahamstown (Mostert 1992). This was the largest known attack by African people against the British anywhere in the African continent. However, despite their strong numbers the Xhosa warriors were defeated and eventually driven out of the area. The area was then transformed into a British settlement of around 5,000 British men, women and children in the following year. The site of the battle is referred to as Egazini, which translates as 'the place of blood' (Wells 2003).

5.1.2 History and arts initiative

In 1999 Professor Julia Wells, from the History Department, Professor Dominic Thorburn, from the Fine Arts Departments and Giselle Baillie, a Fine Arts graduate from Rhodes University, joined forces on a project funded by the Eastern Cape Provincial Arts and Culture Council (ECPACC) and Grahamstown Glass and Picture Framing called "Egazini – the Battle of Grahamstown, Recasting History through Printmaking". This project aimed to re-examine this significant historical event through the involvement of approximately 30 local black and white artists. A group of artists, both professional and amateur, was formed, primarily of people without printmaking experience. A series of historical lessons, field trips to significant sites and printmaking workshops took place over two months. Artists

[5] According to Mostert (1992), there were 450 British Soliders. However, according to Wells (2003), there were 350 British Soldiers.

were interviewed throughout the project to capture their perspectives and experiences and an exhibition showcasing the work that emerged from the project was included in the 2000 National Arts Festival. The exhibition was a huge success, both as an artistic initiative and for its significant positive impact on the artists who took part (Wells 2003; Wells 2012).

5.1.3 Evolution of Egazini Outreach Project

Following the success of the exhibition and with the realisation of the potential socio-economic impact on the artists, "The Egazini Outreach Project" was born. A space was identified in the former police stability unit in Joza as both a permanent exhibition space as well as a workshop for the artists and space to be shared for other artist initiatives, like drama groups for example. Since its initial exhibition in 2000, work from the Egazini Outreach Project has been featured annually in the Grahamstown National Arts Fringe Festival, and selected works have been exhibited both locally and internationally. They have also continued to use the same space in the old police stability unit in Joza, see image 6.

Image 6: Egazini artist in converted police stability unit. Artificial green leaves can be seen in the top right woven around the barbed wire that remains from its former use.

The Egazini Outreach Project has received some funding from various sources for around a decade to help sustain the initiative, particularly from the local municipality and the provincial arts council, ECPAC. However, since the local municipality went into administration in 2013 due to mismanagement of funds, the group have received minimal external support.

Artists who were originally involved in the group have left and re-joined the group over the past 17 years, or left permanently due to either choice, illness or death. At the time of my initial engagement with the Egazini Outreach Project in 2011, there were six artists who were actively part of the group. As of August 2017, four of the artists had passed away and there were only two of the six artists still involved. However, following the most recent passing of one of the artists in July 2017, one of the original members of the group who was only intermittently involved during my time in South Africa is planning on becoming more actively involved again and has plans to restore and expand the group with new artists.

5.2 Research engagement with Egazini artists

This section describes my engagement with the Egazini artists extending across both research cycles B and C. The period of focus is between the initial scoping visit in early October 2011, and the performances of Interplay in July at the 2012 National Arts Festival.

The research activities with the Egazini artists at the beginning of cycle B focussed on laying the foundations to adopt a participatory design approach to designing an e-commerce solution with the artists. This included increasing my understanding of their lives, work and the context that the intended e-commerce solution would be used. It also involved establishing trust and forming relationships with the artists, which was a key part of PAR.

Two scoping visits, five introductory workshops and many informal and semi-formal visits to the Egazini Outreach Project location took place. These are described under their respective headings.

5.2.1 Scoping visits

When considering potential local projects in townships close to Grahamstown, I remembered my visit to the Egazini Outreach Project as a tourist several months earlier in April 2011. The Siyakhula Living Lab and Reed House Systems teams agreed it could be a compelling case study and I arranged two scoping visits to the Egazini Outreach Project.

My isiXhosa teacher, Linda Nelani, accompanied me on the first scoping visit to the Egazini Outreach Project. Its main purpose was to find out if Egazini artists were selling their artwork online, or interested in help doing so. The artists informed us that a white lady from another town had sold some of their cards online in the past. However, it had been a while since she had sold anything and they had lost contact with her. The artists expressed enthusiasm to try anything that would help them sell more artwork. However, when asked if they would be interested in designing something that would help them self their artwork online together, they said that they were interested, but pointed out that they did not know us.

Image 7: Initial scoping visit to Egazini Outreach Project.

This conversation was a great reminder of the importance of relationships for the amaXhosa and that the 'relationship set up' step needed to be repeated for this new

research context. This was also the catalyst for organising an introductory workshop with the Egazini artists where we could share our stories over lunch. Linda and I suggested holding introductory workshops at the Egazini Outreach Project so we could get to know each other. The artists were receptive to our suggestion and we exchanged details to arrange it.

In the second scoping visit Linda and I confirmed details for the first introductory workshop. By chance we met a woman who was at Egazini on behalf of her maid, Feziwe, to help her catalogue her late husband's artwork. Even though Feziwe herself was not an artist, we asked both the artists and Feziwe if she would like to be part of our project as she had hundreds of pieces of her late husband's artwork that she wanted to sell and could potentially benefit from being able to sell artwork online. Feziwe proceeded to join the introductory workshops and served as inspiration for one of the key characters in the educational play Interplay, produced later in the project.

The scoping visits helped establish the Egazini artists' interest in the project and also highlighted the importance of setting up relationships for ICT4D projects.

5.2.2 Introductory lunch workshops

Five introductory workshops were held over a month from November 2011 to December 2011, starting with introductions of my isiXhosa teacher and myself. All introductory workshops took place over lunch and were 1.5-2 hours long.

Image 8: Egazini artists share personal photos during an introductory workshop lunch at the Egazini Outreach Project

Initially my intention was to hold two introductory workshops, one where the project team could introduce ourselves so that the artists could start to feel like they 'knew' us, the second, where the artists could share their stories. For several reasons, including illness within the group and the length of time it took to share individual stories, five introductory workshops were held in total, including a session where the Egazini Outreach Project members met the wider Siyakhula Living Lab and Reed House Systems team members. The purpose of the session with the broader team was twofold. It was for the Egazini artists to see that there was a larger team involved in the project and for the Siyakhula Living Lab and Reed House Systems team members to meet the artists.

Image 9: Egazini artists and Siyakhula Living Lab members meet each other over lunch at the Egazini Outreach Project

The personal background stories shared by the Egazini artists in the introductory workshops also helped to provide the project team with a deeper understanding of their lives, insights into the backgrounds of people living in the township and information that could be used as design considerations when designing an e-commerce application. Artists' stories from these introductory workshops are presented later in this chapter in Section 5.3.

During conversations in the first introductory lunch, I noticed that although members of the Egazini Outreach Project had heard of the internet, the majority of them did not seem to know much about it. Following the workshop, during the debrief session with my isiXhosa teacher Linda, I expressed my desire to enable the Egazini Outreach Project members to participate meaningfully in the design of the e-commerce solution to sell their artwork by teaching them some of the basic possibilities and limitations the internet offered. However, being aware of the varied levels of exposure to formal education and the differences between my cultural background and theirs, I hoped to be able to communicate these in a culturally tailored way. Linda mentioned that storytelling was the traditional way of passing on knowledge for the amaXhosa. When I asked her if she thought it

would be appropriate to use storytelling through narration and acting out the narration for education, she agreed it would be appropriate. In retrospect, this was the beginning of cycle C of the research although I didn't realise it at the time.

5.2.3 Informal visits

Over 30 informal visits took place following the introductory workshops until I left South Africa in July 2012. After each of these visits, I filled in relevant fields in a Google Docs spreadsheet recording the date, time, artists present, summary of the visit and outcome, observations, questions, ideas and 'to do' list. Through these informal visits I was able to learn about the artists and their work context in a relaxed and ad-hoc way and discover things that I may not have thought to ask during an interview.

For example, during one of the visits, I purchased 10 cards. One of the artists went through and read out the names of each of the artists who had made the cards, while another artist recorded these details on a napkin with a pen. From this interaction, I learnt that from each sale, 85% of the proceeds go to the artist directly and 15% are kept for the Egazini Outreach Project. Knowing who had sold what, was incredibly important. In addition to this, I discovered that if it were practical to do so, the artists preferred that two of them were present during a sale so they could verify that the money was going to the right people. On a subsequent informal visit, I learnt that if an artist passed away, then 100% of the proceeds from the sale of any of their artwork would go directly to the family of the deceased artist.

Another example of something I learnt by chance in one of the informal visits to Egazini was that they were doing commissioned work at the time. During this visit, one of the owners of Amakhala Game Reserve, a neighbouring game reserve, came by to check on the progress of some tea towels she had commissioned the Egazini artists to make. The relationship had apparently been set up by the Egazini artist, Linga Diko, who had passed away earlier in the year, but was now being handled by one of the other artists. This chance visit was how I learnt that the Egazini artists were actively working on commissioned projects, as they had not mentioned this

earlier when we discussed their current sales avenues. The visit was also the catalyst for organising a trip to Amakhala Game Reserve with the Egazini artists to both see their artwork at the reserve and go on a game drive with them (see images 10 and 11). At the time, none of the Egazini artists had been on a game drive, despite being surrounded by several game reserves. Organising the game drive for the Egazini artists was an example of a small way I could demonstrate my appreciation of them.

Image 10: Egazini artists holding the tea towels they made for Amakhala Game Reserve.

Image 11: Egazini artists and Linda at Amakhala Game Reserve for a safari.

In addition to helping develop a richer understanding of their work context, the informal visits helped strengthen my relationships with the artists and gain their trust. Over time, the Egazini artists shared their motivations for being artists and what the Egazini Outreach Project meant to them. Key themes that emerged were:

- A love of art, for example:

  "It is just my passion. There is no formula, it just happens." (Egazini artist)

  "When I go around and see stuff on the streets, I like it and draw it, and then see what the outcome will be." (Egazini artist)

- A sense of purpose, for example:

  "I like that place [Egazini] a lot because it makes me feel fresh. Because if I sit at the house and do nothing, I won't feel fresh because you know you're not working... I don't want to sit down and do nothing." (Egazini artist)

- Necessity, for example:

  "I usually come here to do paintings on these materials. When I feel hungry I think I must come to work so I can have a finished product. I no longer have a husband, I am a single grandma and I need to eat." (Egazini artist)

The regular visits reassured the Egazini artists that my interest in them was genuine and that I had not forgotten about them. Over time, the artists also became increasingly open, candid and comfortable with me.

5.2.4 Market field trips

The main ways that Egazini artists sold their artwork was either at the Egazini Outreach Project location in Joza, at large events in Grahamstown such as the National Arts Festival, commissioned work, or at markets in Grahamstown or Port Alfred, a neighbouring town. I joined the Egazini artists on a couple of trips to

markets in Port Alfred and Grahamstown to get an insight into their experiences selling artwork at markets. These trips gave me an insight into how difficult it was to sell their work. For example, on the first trip to a Port Alfred market in December 2011, we arrived at 8am, left at 2pm and spent the majority of the day sitting and waiting for people. Very few sales were made and their total earnings for the day were around R500 (AU$50). As 85 percent of the money went towards whichever artist had created the artwork sold, the Egazini Outreach Project would only have made R75 (AU$7.50). After taking into account the taxi fares of R160 (AU$16, or $8 each return) that they would usually have to pay for two artists to be there, that particular trip would have cost the Egazini Outreach Project R85 (AU$8.50). The amount made would not have even covered their expenses travelling there. This particular trip was made approaching Christmas too, which is usually a relatively busy time of year. The artists reported that it was not unusual for them not to sell anything after spending a day at a market.

Image 12: Egazini artists waiting for customers to buy their artwork in a Port Alfred market

Attending markets with the Egazini artists helped me appreciate first-hand some of the challenges they faced selling their artwork. As one Egazini artist mentioned:

> *"Sometimes we spend a long time and don't sell anything." (Egazini artist)*

My first experience attending a market with the Egazini artists and observing the strategy involved in how their items were arranged was also used as inspiration for the opening scene in the educational play, Interplay.

5.2.5 Disposable cameras

In the spirit of cultural probes (Gaver, Dunne & Pacenti 1999), disposable cameras were given to the Egazini artists at the final introductory workshop. The purpose of using disposable cameras was to help address aim 2B, which was to gain insight into the Egazini artists' lives and their township context. When handing out the cameras, I explained to the artists that I wanted to get to know more about their lives and what they did. They were told they could use the cameras as they wanted, but I suggested that they take photos of things in their daily routine or things that were significant to them. The Egazini artists were then informed that once they had taken 27 photos and used up the film, I would develop two copies, one for them to keep and one for myself. I made it clear that although I would like to see the photos and keep a copy for myself, that it was optional for them to allow me to keep a second copy. If they decided later that they did not want to share the photos with me, I would still develop a copy for them and that was OK.

The Egazini artists each used the disposable cameras in different ways and a large variety of photos were taken. Most of the artists took photos of their family members and loved ones. Many artists took photos of their home. One artist took a series of photos from a circumcision ceremony that took place over Christmas, which I would not usually be privy to seeing (see images 18 and 19).

The disposable cameras reinforced the significance and importance of family to the Egazini artists and provided me with an interesting range of insights into their personal lives. Perhaps one of the most significant contributions of using disposable cameras in the spirit of cultural probes in my research was how much the Egazini artists enjoyed using them and appreciated having their photos printed for them. That is, it served as a small fringe benefit they could enjoy for being part of my research. A selection of photos from each of the Egazini artists' disposable cameras are shared below to provide visual insight into the Egazini artist's context.

Image 13: My son and my house (Vukile Teyise)

Image 14: In front of my new house (Violet Booi)

Image 15: My chair (Violet Booi)

Image 16: My goats (Mamjwarha Daniwe Gonqa)

Image 17: (Mamjwarha Daniwe Gonqa)

Image 18: Circumcision ceremony 1 of 2 (Nomathemba Tana)

Image 19: Circumcision ceremony 2 of 2 (Nomathemba Tana)

Image 20: (Papama Lubelwana)

Image 21: Getting a haircut (Papama Lubelwana)

Image 22: My son next to my house (Feziwe Diko)

Image 23: (Feziwe Diko)

5.2.6 The funeral of Pux

One of the Egazini artists, Papama (Pux) Lubelwana, sadly passed away during my time in South Africa. This is mentioned here because of the insights gained during the funeral arrangement process and as an example of an unexpected event that may be encountered when working in ICT4D projects. The living conditions of

people in the townships meant that there was a greater chance of people dying from illness or issues that would not be considered life threatening for most people in developed economies. For example, one the Egazini artists, who passed away after Papama, died as a result of having diarrhoea that was not treated appropriately. However, these were not things that I had thought about before the passing of Pux.

Funerals are an important event for the amaXhosa. In South Africa, when opening a bank account, you are generally offered the option of opening a funeral plan at the same time. It is an event that many people save for, and are generally widely attended events by not only friends and family of the deceased, but by the wider community.

Image 24: Some community members gather together to eat after the burial of Pux.

Helping to arrange certain small aspects of the funeral, for example printing out memorial flyers and taking photos for Pux's relatives, gave me insight into the Xhosa culture as well as strengthened my relationships with the remaining Egazini artists. The funeral ceremonies for Pux tested and challenged my personal boundaries as a researcher as there were many things that needed to be done, and a lot of people who needed help. Showing active support for the Egazini artists during this period felt especially important for demonstrating how much I valued and respected them as people, not just research participants.

5.2.7 Egazini artists at Interplay performances

Egazini artists attended the premiere performance in the Joza township, as well as several other performances at the National Arts Festival. Following each performance at the National Arts Festival, audience members were given the opportunity to buy a selection of artwork and cards from the Egazini artists. More detail about the Egazini artists' involvement in, and responses to Interplay is provided in the next chapter, Chapter 6.

5.3 Background stories of the Egazini artists

Egazini artists shared selected stories about their background and photos during the introductory workshops in isiXhosa, which were later translated into English. Transcribed and translated versions of these stories are presented, with the artists' permission, in this section as they provide an interesting and useful window into their lives. The unedited transcripts of the artists' stories help to bring their context to life with a richness that could easily be lost when consolidating findings and insights. It also helps to enable a level of empathy, or putting yourself in 'their shoes' in a similar way that films, documentaries and novels do, as the challenges of their lives are made very visible. References have been made to the photos that the artists shared in the introductory lunch workshops because the transcripts have not been edited. However, these photos are not included in this thesis as they were from the artists' personal collections. The stories of the five active members of the Egazini Outreach Project and the widow of a former member are presented in sections 5.3.1 to 5.3.6. A photo of the artist and one of their pieces of artwork is included with their stories.

5.3.1 Vukile Teyise

Image 25: Vukile Teyise, “Vux”, 1959 - 2017

My name is Vukile Teyise but people around here call me Vux. My clan name is Mpehle. I am married with two kids. I was born and bred in Grahamstown in 1959. I now live in Joza No 44D Extension 9, my house is closer to Nomathemba’s house, and that is my new own house. My parent‘s house is in Joza too. We are 8 siblings, 5 girls and 3 men. My mother passed away in 2000. She was close to my youngest sister, who also passed away in 2009, as she could not take it after losing my mother. She was 30 years old. She had two children, boys.

Here is my picture; it was taken from Dakawa where I learnt art. The name of this centre is borrowed from a language in Tanzania. Here is another picture of mine taken for Brad Amble Art competition.

Another picture, here is my son, 9 years old. I have 2 kids, a boy and a girl and my daughter is 3 years old. I started art in 1993. I was trained at Dakawa. Egazini was established in 2000 and I started Egazini in 2003 under Julia Well’s supervision.

Growing up, my mum used to sell vegetables at Grahamstown. She used to carry the box full of vegetables on her head. She taught us business skills too. After school we used to go around selling vegetables. We also had to put those boxes on our heads to sell in town. My dad used to go to the market early in the morning at

about 03h00 or 04h00 to buy vegetables every day, except Sundays. Sundays were church days. We all had to go to church.

We used to stay in a two room house. Half of the living room was filled with vegetables. My sister, who is now a teacher and married, still enjoys selling stuff, anything from herbs, clothes, dishes you name it. She has an eye for what is on demand in the community and uses such opportunities to sell what's needed at that particular time. For an example, during the Rugby World Cup she was selling T-shirts. My wife is also a business minded person. She is selling fruit like peaches, pineapples, oranges, depending on the availability of that fruit. She sells her fruit at the Fort Beaufort, King William's Town junction.

Image 26: African Woman, print 1 of 30

5.3.2 Violet Booi

Image 27: Violet Booi, “Mama Booi”, b.1940

I was born in 1940 in Clumber, near Bathurst. I was not raised by my parents, but my grandparents. Up to today I am so proud of them, they did a great job as they trained me so well. I am a fully-fledged woman because of their teachings. Unfortunately they did not send me to school. Adults in those years did not like sending their children to school.

We later moved to Grahamstown where we stayed in Ragland Road. I started working here as domestic worker. Since then I have moved twice. First, to M Street No 3, and later to Extension 6, No 5374, where I still reside today. I am happy there because that is my own house. I am a single mom with 4 children, 3 boys and 1 girl. I do not have pictures of my 1st and 3rd born children, but I have one of my last born, my son. Here is a picture of myself at home, in my garden. We plant a lot of veggies, we learnt those skills at Umthathi Training Project, and we must show others in our community what we do so that they can also learn from us. In the Umthathi Training Project, we learnt skills like making the flour for our projects here.

Image 28: Bag made from hand painted material using bread flour

Here are other pictures of our product, where we had to paint rubbish bins before the World Cup in June 2010. We were commissioned by the Tourism office. We were given some incentives for this project. The Umthathi Training project's office is in Extension 7, near Nomathemba's house.

5.3.3 Mamjwarha Daniwe Gongqa

Image 29: Mamjwarha Daniwe Gonqa, “Mama Gonqa”, b. 1932

I was born in Mqondobowa, near Alice. My parents married the traditional way. My father used to work in Johannesburg, he used to visit the family on holidays. One time when he was leaving back to Johannesburg, as usual someone had to make provisions for him, and this time my aunts prepared food for him. As he left for work in Johannesburg, it was said that he died on his way on the train. My aunts poisoned his food and he died on the spot due to food poisoning. This was an unfortunate time for my mother as she was pregnant with me at the time. I was born without a father. My mom was told to go to her family house.

I got married had 8 children, 4 passed away - 2 boys and 2 girls. I am now left with 3 boys and 1 girl. I also raised my husband’s daughter, she now has brothers and a sister because my husband remarried. Here is a picture of my last born, Mzikayise, my other children’s names are Nomhi, Richard and the one who is in Johannesburg.

Image 30: Elephant linocut card

I started Egazini 15 years back after I arrived here in 2000, from Umthathi. During the solar eclipse I was a teenager working on the fields somewhere. We were asked not to look at the sun, and we had to cover the younger ones with blankets so that they should not look at the sun as well. The sun was shining bright and became dark again, and later it became very, very dark as we were working. When we reached home, we were all looking down. We got home, then we saw that there was a light coming through the cracks on the door. It was only then that we were allowed to open the door and go outside again, still not in clear light. The sun showed up normally the following day. This is another picture of mine; here I had already had a child.

5.3.4 Nomathemba Tana

Image 31: Nomathemba Tana, "Mama Tana", 1953 – 2015

I was born in the 1950's near Port Alfred in a place called Tyelerha. We were 4 kids, 2 boys and 2 girls. I grew up within the Ngwevu clan but I am a Mamkwayi. I was schooled at Brython school till Grade 6. I dropped out of school in 1968 due to my parents' divorce. My mother was a domestic worker. I started working in 1969 and in 1970 I met a guy with the name of Mali a mSukwini. We got married and had one child. Unfortunately we divorced and I had to live with my mother. I relocated to PE [Port Elizabeth] where I worked for about a year. I came back to Grahamstown in 1982 and started working in Kingswood as a chef. I worked there for 12 years.

Here is a little story about how I got my first job at Kingswood. I was still a little girl who really looked slim and small to be looking for jobs, and that really worked well for me. On the very first day I came to Kingswood looking for a job, everyone told me that I was too young to work and I should be at school. I then had to "cook" a story so that they could employ me. I told them that I was still in school, but could not continue that year as I was having financial issues. They all felt pity for me and I got the job. The idea was to work for that year and go back to school the following year. They were all taking care of me and assisting me in all that I was doing. They showed me how to do my work and everybody was really kind to me, as I was the youngest and tiny. But as time went by, and as I was getting used

to them and having gained some confidence and experience in what I was doing, baking, I told some of my colleagues who I really was. That I was married before and now actually a divorcee and I had already had a child by then. They took it lightly and it was the joke of the day. It was actually "the survival of the fittest". They all laughed at it, I included, and some jokingly called me a skelm. I enjoyed working there, but I had to stop in 1992 and started working as a domestic worker here in Grahamstown.

In 1995 I joined the Masikhule Women's Group Project which is at Mthathi in Extension 7. When I joined, I started with art only and by then I had no experience at all except for some knowledge from school. I also did hand painting on fabric and sewing. In 2000 I moved to my own house in Extension 6 where I am still living. We were trained by the lady from Rhodes who was teaching us sewing and hand painting. I was awarded a certificate from that course. Oh!, she gave us good lessons! The training took place here in town near the station. I also worked in the North End jail helping women prisoners, teaching them hand painting, and also how to make cushion covers, table cloths, waist coats, bags and aprons. I joined Egazini in 2000. I was involved in painting the Battle of Makana.

Image 32: Amanzi Amthatha, print 8 of 15

5.3.5 Papama Lubhelwana

Image 33: Papama Lubhelwana, “Pux”, 1967 – 2012

I am a Sotho, and Mpevu, is my clan name. I was born in Grahamstown, in J Street in my maternal grandfather’s house. We are a big family. My grandfather had 2 wives; he was the principal at Andrew Moyakhe School. We are 5 children from my mom and dad. Dad had other children out of wedlock. The fifth one, Shadi passed away; she was shot by her school principal. We believe this incident stressed my mother so much and she died 3 years back. She was still teaching in Nyanga in Cape Town. I do not have children, but my sister who passed away had a daughter who is now my daughter, she is 15 years old.

My dad died a long time ago in the 1970’s. I did not attend his funeral as I was still too young. Even though I did not attend my dad’s funeral, I know where his grave is in Joza. Dad had 5 children and 3 girls passed away in Johannesburg. There’s only me and my brother Eric, who now lives in Bisho. His mom stays in Fonas Kaap in Zwelitsha.

I grew up in J Street in Joza and started school in Andrew Moyakhe when I was 4 years old. In 1984 we moved to another house in E street in Mnkqayi. I used to take care of the cattle. We then moved to Cape Town, and lived in Gugulethu Ny 50. I schooled at Sokhanyo Primary, then at Siviwe Higher Primary. My mother

Matshangisa used to teach at Fezeka High School. I went to study there until matric but did not pass - I was short of two subjects to complete my matric.

I started at the Art Centre in Nyanga where I met Billy Mandindi an artist. He's no longer alive now. He was the one who introduced me to more people, and my passion for art developed since then. I am passionate about art, I love it. I used to enter art competitions.

In 1987 I went for circumcision together with my 4 cousins in Zwelitsha. My uncle Sipho died in 1993 due to food poisoning. He was poisoned by his wife and her daughter from another marriage, hoping to "cash him in" with the hope of getting R10,000 from his life insurance and pension fund. We moved back to Grahamstown in that same year. I then met Ashman, an artist who was also coaching me in art. He saw me at ZARAF, Zamani Rini Arts Foundation, a place that was situated near the station. He introduced me to painting.

I started in Dakawa in 1998, where I learnt everything from graphic to textile design. I got a certificate in Graphic Art and in 1999 I won the National Arts Council Logo and won some cash. Then all artists decided to make history through paintings. I and others started shaping up this place [Egazini] and cleaning it up. When I arrived, the guys were cleaning up what is now the shop. We as artists thought that this place would be convenient for us to use. I also came into contact with Prof Dominic Thorburn in Fine arts at Rhodes University. He attended one of our exhibitions, together with Nyaniso Lindi.

I, together with 14 other artists were selected to represent the Eastern Cape and I am the only one who will represent Grahamstown in the Arts Competition which will be held in America. The interview is in January 2012. I am excited about this competition and am hoping to visit other countries as I have not been to other countries before. I have exhibited work on the internet too and all over. What is nice about the internet is that even if one does not go out of the country, his work travels.

Image 34: A Boy with his Child, print 3 of 10

5.3.6 Feziwe Mthwarha Diko - wife of Linga Diko, deceased Egazini artist

Image 35: Feziwe Mthwarha Diko, “Feziwe”, b. 1960

My name is Feziwe Mthwarha and my clan name is Mmzangwa, I am married to eMangqosinini. I was born on the 18th June in 1960. My dad passed away when I was 7 and I was since then raised by my mother. It was not easy, as she was the only person working and supporting 5 kids. My brother died a long time ago, and we are now 4 girls. My mother also passed away in 2002. I’m the last born. I went to school until standard 5. I could not continue due to financial constraints.

After school, I started doing little jobs. I have 3 children. My first born child is out of wedlock and I have 2 with my husband, both boys. My first born Ntombovuyo stays in PE [Port Elizabeth]. She has a daughter Asemahle, who is 7 years old now. She is in Grade 1. I am a grandmother. My boys go to Nombuleleo High School. Sandisiwe is 17 years old and in grade 10 and his brother Sinethemba is 15 years old and in grade 9. I used to work at Kingswood, as a baker. Here are my pictures:

My mom and aunt

My mom and her friend

Linga

Me and Asemahle

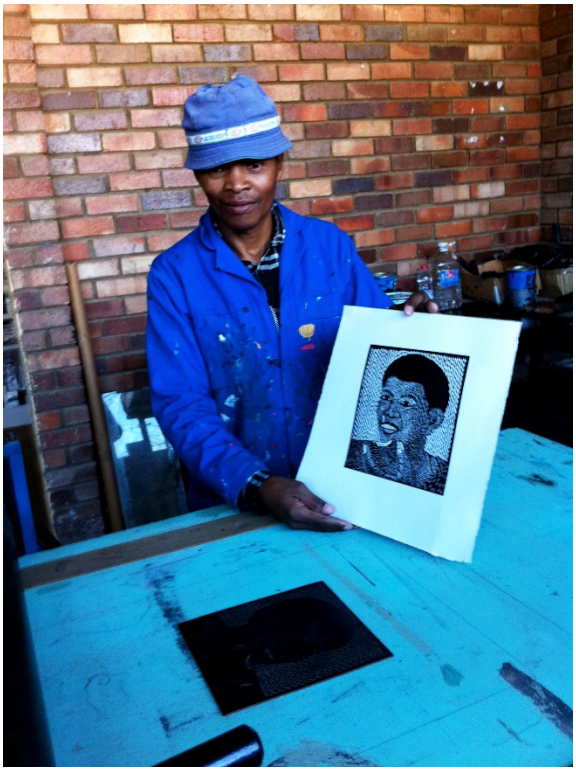


Image 36: Feziwe's late husband, Linga Diko, 1963 – 2011

Image 37: Amanzi Awekho by Linga Diko, print 12 of 15

5.4 Reflections and learnings

There were many learnings from my engagement with the Egazini Outreach Project. These were not only about the Egazini Outreach Project and artists, some of which were discussed earlier in this chapter, but learnings about working with communities in ICT4D projects. Key learnings based on this research that could be applied to other ICT4D projects relate to the:

- Critical role of relationships,
- Role of unplanned significant events,
- Need to foster multiple champions,
- Consideration of training needed, for example, business training, and
- Blurred line between professional and personal investment.

These are summarised under their respective headings below in sections 5.4.1 to 5.4.5.

5.4.1 The critical role of relationships

During the first scoping visit to the Egazini Outreach Project, I was reminded by the Egazini artists of the importance of relationships for setting a solid foundation for a project. Through the introductory workshops, informal visits and regular contact with the artists, trust was established between the Egazini artists and myself. This contributed to them becoming increasingly open and candid over time, and was also a significant factor in the relatively smooth transition when the project changed its focus from designing an e-commerce application to the production of an educational play. If the relationships and trust had not been as strong, there would have been a greater risk that the Egazini artists may have felt betrayed or mislead when we were not able to fulfil our original intention of creating an e-commerce application.

5.4.2 Unplanned significant events

There were many unplanned events that occurred throughout my engagement with the Egazini Outreach Project that led to delays to the research timeline and/or the need to change my research plan. The most significant of these, was the passing

away of one of the artists in the middle of the research project and at a time-critical stage. Although there were multiple activities that were scheduled to take place during that time to be able to meet project deadlines, in order to respect my relationships with both the artist who had passed away and the remaining artists, I needed to adjust my schedule. It was also important to the Egazini artists that I be involved in the funeral, which required a significant amount of time. My involvement helping with some aspects of the funeral were both an interesting learning opportunity, in terms of insight into the Xhosa culture, but also emotionally challenging. Through the passing of one of the artists, I experienced the difficulty and sadness of losing someone who I was getting to know. From a research perspective, it was an unfortunate reminder that when working on ICT4D projects with communities, there is a greater chance of encountering these kinds of events, and it is helpful to be aware upfront of the potential emotional challenges you may be exposed to as a researcher in this context.

5.4.3 Fostering multiple champions

Following on from the previous sub-section, the passing of one of the artists during the research caused me to reflect on the role of fostering champions in ICT4D projects. It is a common strategy in technology projects to look to develop a champion who will help to pioneer, promote and lead an initiative. Unfortunately when working with socioeconomically disadvantaged communities, developing just the initial champions of an initiative may not be enough, as community members are more likely to suffer from illness and premature death. The passing of two other Egazini artists since I left South Africa in 2012 is a harsh reminder of this fact. The greater chance of illness and death suggests that the continued fostering of champions may be required for an ICT4D project or initiative to be sustainable.

5.4.4 Consideration of training needed

In addition to these challenges, the people involved in this project were all artists, or an artist's widow. When observing how they conducted their business during informal visits and trips to markets, it became clear the Egazini artists had no business training and their interest and abilities in running a business varied. It

certainly could not be assumed. If an e-commerce solution were going to be designed for the Egazini Outreach Project, it would be important to provide either business training or external support for the business side of running the e-commerce service.

This was a reminder that in ICT4D projects, elements other than the technology may need to be considered for a project to succeed. For example, for an e-commerce application to be successful for the Egazini Outreach Project, it would not only need to be designed in a way that was useable to the artists, but other elements of the business and the training relating to those elements would need to be considered. This would include things like the reliable postage of artwork domestically and internationally, and how to handle payment issues that may arise.

5.4.5 Blurred line between professional and personal investment

When investing in relationships and trying to ensure that participants in a project are able to gain from an initiative, the lines between professional and personal involvement can become blurred. This was my experience working with the Egazini Outreach Project and I have continued my connection with Egazini since the research ended. Both during and after the research, I have needed to assess my personal level of involvement with the artists and the associated challenges.

Blurred lines between professional and personal involvement are not necessarily negative, but it may be helpful for other ICT4D projects to be aware of them. This is particularly relevant for projects adopting a participatory approach over an extended period of time.

5.5 Summary of research cycle B

The introductory workshops, informal site visits, market field trips and disposable cameras each added to gaining an understanding of the Egazini Outreach Project and the artists' lives. This understanding was used to inform the creation of a preliminary list of requirements for the e-commerce application to help Egazini artists sell their artwork online, which were shared with the Siyakhula Living Lab and Reed House Systems team. However, the realisation early in the research cycle

of how the Egazini artists' limited understanding of the internet could inhibit meaningful participation, triggered the third cycle of research, cycle C. This resulted in research cycle B being a relatively short one, as seeking ways to communicate the possibilities the internet offered in a culturally tailored way became the new focus of my research.

The most significant change in aims from research cycle B to C was the change from an application design related aim to a methodological related aim. More specifically, aim 3B was to design an e-commerce application to help Egazini artists sell their artwork online. This aim changed in cycle C to aim 2C: creating an educational play so the Egazini artists could better understand the possibilities and limitations of the internet. The change in aims was made as finding ways to support meaningful participation was considered a priority before other technology solutions could be designed using participatory methods.

The other significant change in aims between research cycles B and C, was the change from aim 2B: familiarising myself with the local context, to aim 3C: ensuring benefits to the community remained once my PhD research was completed. That is, a shift to handing over my research in a way that enabled continuity beyond my involvement.

The aim of making a positive contribution to the Siyakhula Living Lab was a key aim of my research, and the only aim that remained consistent across all three cycles of research. The new focus of research cycle C to finding ways to support meaningful participation, was also something that could potentially benefit other parts of the Siyakhula Living Lab. The limited engagement of members of the community in the Transkei identified in research cycle A supported the potential for this new focus to be useful to the wider project.

Unlike the transition from cycle A to B, there was an overlap between cycles B and C. This was partly because research cycle C was identified in retrospect after realising that the design of an e-commerce solution would not be possible in the remaining time given the amount of time needed to produce Interplay. An additional reason for this overlap is that activities relating to understanding the

Egazini artists, such as informal site visits, continued throughout research cycle C, even though they did not directly relate to any of the research aims in cycle C. Instead, they continued to honour the relationships developed with the Egazini artists and to facilitate the handover of the relationship from me to other members of the Siyakhula Living Lab.

The primary focus of research cycle C, the creation of the educational play Interplay, is discussed next in Chapter 6.

6

Interplay: The Internet Education Play

The focus of research cycle C was the creation and production of Interplay, an educational play about the internet. Interplay is an example of a culturally tailored method to support mutual learning in ICT4D design and is one of the main contributions of my research.

This chapter provides an account of how Interplay came to be. It includes an account of the process of producing the play, a description of the premiere performances and a discussion of learnings from the experience.

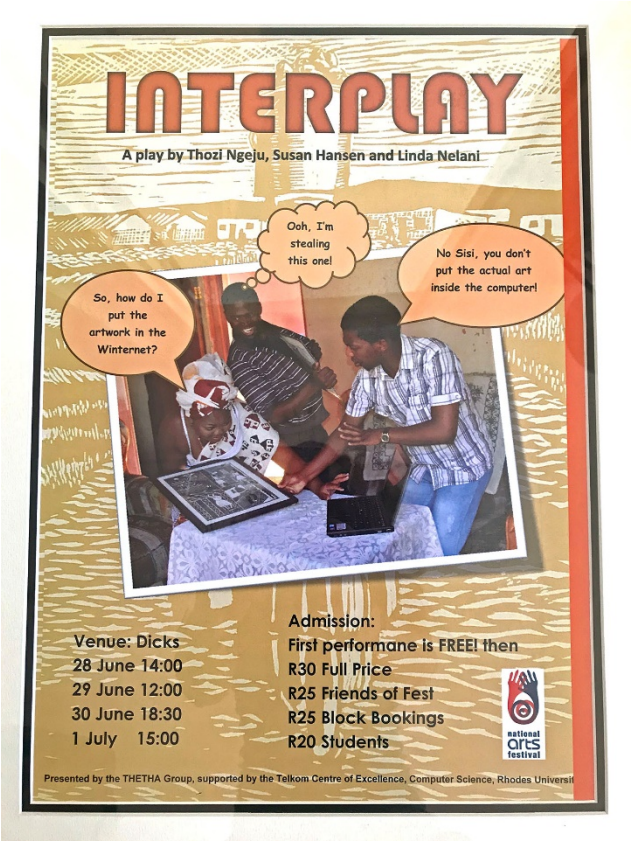


Image 38: Interplay promotional poster for the 2012 National Arts Fringe Festival in Grahamstown, South Africa

Interplay is an educational play that explores some of the possibilities and limitations the internet offers through the experiences of six characters from the Joza Township. The narrative centres on an exploration of how the internet can provide opportunities for the character Fafa, whose husband has passed away and left her with hundreds of pieces of artwork that can be sold, and Webster, a happy go lucky man who makes his living stealing. The six characters are fictional, but real people and events provided inspiration for elements of the story in the play.

The production of Interplay marked the transition of my research focus from designing a mobile application for socioeconomically disadvantaged communities in the Eastern Cape of South Africa, to a methodology focus investigating how to empower community members to have meaningful input into the design of solutions developed for them. The initial motivation to create Interplay was to communicate, in a culturally tailored way, the possibilities and the limitations of the internet to the Egazini artist's. The rationale was that if Egazini artists had at least a basic understanding of the possibilities and limitations of the internet, they would be better placed to participate meaningfully in designing an e-commerce application to help them sell their artwork online. The play was conceived because of the relationship between storytelling and passing on knowledge in the Xhosa culture. The potential for the play to be used to educate and engage other communities around Grahamstown, as well as other communities involved in the Siyakhula Living Lab, contributed to the shift in my research focus.

Interplay exists both as a tangible outcome of my research, as well as a case study of the creation of a culturally tailored method in an ICT4D project. This chapter provides an account of activities and processes involved in the creation and initial performances of Interplay. A recap of research aims and questions for cycle C is contained in Table 18 for context.

Table 18 Recap of research aims and questions for cycle C

Aim 1C: Make a positive contribution to the Siyakhula Living Lab and related communities.

Research question 1C: How can stakeholder interviews influence project contributions?

Research question 2C: What are the benefits of conducting stakeholder interviews?

Aim 2C: Create an educational play so the Egazini Outreach Project artists can better understand the possibilities and limitations of the internet.

Research question 3C: What is involved in producing an educational play for a non-English speaking audience?

Research question 4C: How will the theatre piece for education and engagement affect the Egazini Outreach Project artists' understanding of the internet?

Research question 5C: What are other potential uses for the educational play?

Aim 3C: Ensure benefit to the community remains once my PhD research has been completed.

6.1 Motivation behind Interplay

The engagement with the Egazini Outreach Project, described previously in Chapter 5, was the catalyst for the transition of research focus. Although the idea for creating a play about the internet felt like it came about spontaneously following an introductory workshop with the Egazini artists, there were several factors over a period of time that contributed to laying the foundation for this idea to emerge. For example, the need to explore how to empower meaningful voices from community members was identified earlier in the research journey during

field trips to the former Transkei and stakeholder interviews conducted in research cycle A.

One of the surprising discoveries during the stakeholder interviews and early fieldwork in cycle A was the lack of engagement with, and knowledge of the Siyakhula Living Lab in the communities outside the schools where it had a presence. This was despite the potential value that the Siyakhula Living Lab offered and its presence in some of the communities for over five years. One of the stakeholder interviews with a school teacher involved in the Siyakhula Living Lab revealed that the majority of teachers in these rural areas were from towns and townships that were a significant distance from the schools in which they taught, and did not necessarily engage with the local community of the school they taught in. The teachers were therefore not only outsiders in these communities, but tended to be relatively privileged.

This lack of integration of the teachers with the local communities helped explain some of the challenges the Siyakhula Living Lab had in engaging the broader community. It also highlighted the need to invest in an engagement strategy to reach members of the community.

The lack of engagement of community members with the Siyakhula Living Lab despite the potential value to them and the length of time the project had been present in the community served as a reminder of two key things:

1. The potential value of a solution or program is not something that can be assumed to be obvious and shared by community members for which it is intended, and
2. Having an elegant solution, service or program is not enough within itself. It is important to explore ways to communicate the potential value, engage members of the community and to enable members of the community to have a meaningful input in the provision of a service or program. This can be a significant piece of work in its own right.

While the Siyakhula Living Lab had done an excellent job investing in programs and services for various communities in the former Transkei, the majority of effort was focussed on technology solutions and infrastructure. This highlighted the gap that existed in exploring how community members may be more closely engaged.

An additional factor to note about the communities engaged with the Siyakhula Living Lab was the varied levels of exposure to formal education that were usually of poor quality, especially in rural and township areas. The varied level of exposure to education was also apparent during the introductory workshops with the Egazini artists. Historical issues relating to apartheid were a major reason for this varied level of exposure to formal education. During apartheid, the education available to the Black population was intentionally worse. There were, and continue to be, challenges associated with getting interested, motivated and good quality teachers, particularly in the very remote communities. During my fieldwork in the Transkei, I frequently heard stories of teachers leaving their classes early or not showing up at all.

My experiences in research cycles A and B with community stakeholders in the Transkei and with the Egazini artists made me realise that exploring methods to engage and communicate ideas in an inclusive and culturally tailored way, could be useful for both my research and the Siyakhula Living Lab. This realisation was reinforced by the lack of engagement with the Siyakhula Living Lab of community members in the Transkei and by the prevalence of limited, poor quality education in both community members in the Transkei and the Egazini artists. A further realisation that storytelling is the traditional way of sharing knowledge for the amaXhosa, supported the idea of using a play for the purpose of both education and engagement. In addition, performance and enacting scenarios has been used and is recognised as a useful tool in Interaction Design, HCI and related fields (e.g. Kantola et al. 2007; Light et al. 2008; Loke & Robertson 2005). Performance has also been used in Development field for decades, particularly for health education. For example, it was used to educate children about Malaria in India (Ghosh et al. 2006) and educate school children about HIV/ AIDS in South Africa (Denman et al. 1995). A helpful overview of the use of drama and theatre for social change and

education can be found in McCammon's chapter 'Research on drama and theatre for social change' in the International Handbook of Research in Arts Education (McCammon 2007). The remainder of this chapter focuses on the creation of Interplay, its reception by the Egazini artists and learnings. This begins with an overview of the activities relating to Interplay outlined next in Section 6.2.

6.2 Creating Interplay: Transforming the idea into reality

The process of transforming the idea of creating an educational play about the internet into a reality was a lot more complex and took a lot longer than originally anticipated. However, the play was also more significant than originally anticipated, for both my research and the actors involved. A summary of the key activities relating to the creation of Interplay is outlined in Table 19. This chapter will focus on activities relating to the development and first performance of Interplay. As the play continued to be performed after I left South Africa the table also includes a selection of activities that happened after my research ended in 2012. Highlighted sections of the table are discussed in more detail later in this chapter.

Table 19 Key Interplay related activities

Date	Activity	Outcome	*
2011			
Nov	First workshop with Egazini Outreach Project	Idea to use storytelling to describe the possibilities and limitations of the internet emerged	
Dec	Script Development	First draft of Interplay	*
2012			
Jan	Refining script, recruiting actors, National Arts Festival submission	Evolving Interplay	*
Feb	Introductory session with actors, arranging costumes and props	Preparation for pilot performance #1	*
Mar	Pilot performance #1 as part of Rhodes University Community Engagement Week	Received feedback on pilot performance #1	*
Apr	Feedback from performance #1 incorporated	Play revised for pilot performance #2	
May	Pilot performance #2 at Rhodes University	Received feedback on pilot performance #2	*
May	Feedback from performance #2 incorporated	Play revised for premiere performance	
Jun	Premiere performance at Noluthandu Hall in Joza	Play performed for Egazini Outreach Project artists and Joza community	*
Jun - Jul	Four performances at National Arts Festival, Grahamstown	Further opportunities for actors, education outreach to larger audiences	*
Post research activities			
Sep	Workshop with Swallows Foundation	Professional input into script and performance	
Oct	Children's version of play developed and performed	Play outreach extended to school age groups	
2013 - 2014			
Mar	Creation of Indiegogo funding campaign to film	Funding secured to film	
Apr	Interplay filmed and performed at Dwesa	Producing asset for educational outreach	
2013 - 2014	Play continued to be performed (without my input)	Further educational outreach and opportunities for actors	
2015			
Jan	Submitted to 2015 National Arts Fringe Festival	Further opportunity for actors	
Jul	Play performed five times at National Arts Fringe Festival	Further opportunity for actors and educational outreach. Opportunity for Egazini artists to sell artwork.	

*Discussed in more detail later in this chapter

The remainder of this section will focus on key elements involved in creating Interplay up until the first pilot performance. These are described to provide insights that may be helpful for other ICT4D projects considering the use of theatre

for education. A list of the components needed for the production of Interplay are included in Table 20, followed by a description of key elements described under their respective headings, including:

- Finding a writer and director,
- Creating the script,
- Recruiting actors,
- Arranging costumes and props / elements needed to produce Interplay, and
- Seeking help from the Rhodes Drama Department.

Table 20 Components needed to produce Interplay

#	Required components
1	Writer and/or script
2	Actors
3	Director
4	Props (artwork, furniture, computer, kitchen utensils, food and drink)
5	Music
6	Catering
7	Venues
8	Sound equipment/ expertise
9	Lighting equipment/ expertise
10	Transport for performers and play attendees
11	Support - you can't do everything yourself!

6.2.1 Finding a writer and director

Finding someone to write and direct Interplay was a surprisingly serendipitous and smooth process. One of the people involved in the Siyakhula Living Lab, Thozi, was a casual Computer Science staff member who grew up in, and lived in one of the townships of Grahamstown. When discussing a potential engagement with the Egazini Outreach Project with the head of the Siyakhula Living Lab, he suggested that Thozi might be able to help provide advice about the township context. As a fortunate coincidence, Thozi was not only competent in the area of computer science, but was also a director, actor and writer who had written a play that had won some local awards a few years earlier.

Thozi was very excited by the possibility of combining his diverse skills to write a play about the internet. A meeting was then arranged to discuss the play in more detail. Given Thozi was far more familiar with the world of theatre, I was initially reluctant to be overly prescriptive. Instead, I wanted to give him room to apply his expertise.

The first meeting about the play went for an hour. In this meeting we discussed the learning outcomes I hoped could be achieved by the play, as well as the importance of the play being entertaining and accessible to the Egazini Outreach Project artists. Thozi estimated it would take him a couple of weeks to write the first draft and that it should be relatively straightforward to create. The meeting went well and I left feeling we were on the same page, hopeful and excited.

6.2.2 Creating the script

After waiting for a month for the first draft, I suggested that Thozi send me whatever he had done so that we could discuss the general direction. He agreed and shared a document that contained a mixture of English and isiXhosa. As my isiXhosa was limited I contacted my isiXhosa teacher, Linda, and asked for her help reviewing the draft.

After reading through the first draft, Linda informed me that the script was heavily technical and contained language and content that would be inappropriate for our intended audience. From that point, I began to appreciate the amount of work to be done between having an idea and turning that idea a reality. I also asked Linda if she was interested and willing to be involved in the development of the play, to which she agreed.

After realising the gap between the vision Thozi and I had for the play and with Linda's interest in being more involved, I arranged a time for us to workshop the script. In this workshop, Linda and I began by acknowledging the positive aspects of what Thozi had developed, for example, the back story of the characters. We then discussed revising the script to be more suitable for the Egazini Outreach Project artists. One of the most significant updates was the decision to use the

story of an Egazini artist's widow, Feziwe, as one of the major storylines in the play. Thozi was receptive to the feedback and we proceeded to brainstorm ideas for a new play narrative. Over a period of two hours, Thozi, Linda and I mapped out four scenes of the play and agreed on a new direction. Following the brainstorming session, we asked Feziwe if she was comfortable with us using elements of her personal story in the play. She supported this idea and we proceeded with the new direction.

Two days after the brain storming session Thozi presented us with a significantly updated script that formed the foundation of Interplay. Several minor adjustments were made to the script over the next week, followed by Thozi beginning the process of recruiting actors. A significant percentage of this version of the script continued to be used for years, even after updates made following the pilot performances and involvement of the Rhodes Drama Department.

6.2.3 Recruiting actors

After the script was relatively well developed, the next step was to recruit actors. Thozi recruited the actors from township areas surrounding Grahamstown from people he had worked with in the past and their friends. Actors were recruited with the understanding that they would be paid a small amount for each performance that was held. All of the actors approached were enthusiastic about the opportunity to be in the play.

When the parts were all filled, an initial kick off meeting was arranged. From the first group meeting, the actors were encouraged to provide their feedback and suggestions for improving the play, particularly regarding the educational aspects of the play. They were receptive to this idea and through the process of learning the lines for their characters and understanding the dialogue, they offered many suggestions for improving the play. An interesting unintended consequence of the actors' involvement in Interplay was that they also felt that they learnt things about the internet through their engagement with the dialogue.

6.2.4 Arranging costumes and props

Costumes were arranged using a combination of clothing owned by the actors, clothing made by the Egazini artists and new clothing purchased locally. When arranging costumes several things were considered which included:

- Exploring how the Egazini artists could benefit by providing them with work through employing their textiles skills.
- Purchasing or making clothing that the actors may want to wear outside the play (where possible), so that they would be able to receive a fringe benefit for their involvement. This was especially important, as we did not have appropriate budget to pay them for rehearsal time.
- Fairness. Actors feeling like they had received equal or equivalent benefits was socially and culturally important. For example, in the first version of the play, the actor who played the widow only required a widow's outfit. This outfit was tailor-made for her by an Egazini artist, but was not something she wanted to wear outside the production. As the other female characters were able to benefit from at least one item of clothing that they could wear outside the production, the actor who played the widow was also given the opportunity to choose an item of clothing she wanted.

Props used for the play were organised using a combination of items that Thozi and I owned, and artwork both purchased and borrowed from the Egazini Outreach Project. As food featured in the play in a dinner scene as captured in Image 39, real food was purchased for dress rehearsals and for the play. Actors were also given choice of food according to their preferences. This served not only as a realistic prop for the stage, but as a thank you meal for the actors.

Image 39: Interplay dinner scene

The process of arranging costumes and props for Interplay considered how Interplay actors and Egazini artists could receive benefit. Arranging costumes and props was an area in the play production that tangible short-term benefits could be realised by both the Interplay actors and Egazini artists.

6.2.5 Seeking help from the Rhodes Drama Department

I approached the Rhodes Drama Department relatively early in the process. The initial motivation was logistical, that is, to request use of the Rhodes performance space for key rehearsals and the pilot performances. However, recognising my lack of experience in theatre, I also requested guidance on the process of producing a play as well as artistic and technical mentoring.

The drama department provided invaluable support, including providing rehearsal space and space for the pilot performances. However, due to the space needs of students in the Drama Department, the time available to us was limited and restricted to pilot performances and rehearsals directly before the Interplay pilot performances. Therefore, regular rehearsal spaces were organised at a school in the Joza township or took place at the actors' homes (e.g. see image 40).

Image 40: Interplay rehearsal outside an actor's house in the Joza township

Members of the Drama Department also provided excellent support in some of the technical aspects of the play including sound, lighting and projecting subtitles. In addition, one of the technical support members of the Drama Department provided a significant amount of general mentoring, guidance and personal support in the process of producing a play.

6.3 Evaluating and refining Interplay

To evaluate the Interplay concept and improve the chances of Interplay communicating the possibilities of the internet while also being entertaining, the production underwent several iterations. Two pilot performances took place at the Rhodes Box Theatre with support and assistance from the Rhodes Drama Department. These took place prior to the performance for the Egazini Outreach Project artists and the community in the Joza Township. Following the township performance, Interplay was also performed four times during the National Arts Festival. The pilot performances will be discussed under their respective headings below, and an account of the township and festival performances is provided in Section 6.4.

6.3.1 Pilot #1 for Community Engagement Week

Community Engagement Week, a week dedicated to community outreach, was an event held at Rhodes University annually. This event was identified as an

opportunistic time to perform the first pilot of Interplay by Alfredo, the head of the Siyakhula Living Lab. The Community Engagement team added the pilot performance to their list of events being promoted for the week. The Rhodes Drama Department and Department of African Languages also put out an open call for people, particularly those who spoke isiXhosa, to attend the pilot event. Contacts in the Journalism Department helped by arranging to film the initial performance and subsequent audience feedback session. The widow of the artist who had passed away, whose story was used as inspiration for one of the major characters, was also invited to attend the pilot performance. This was to check if she was comfortable with the script, as one of the major storylines was loosely based on her situation and her comfort and approval were important before the play was more widely performed.

The first formal, full dress rehearsal was held the day before the pilot performance and went smoothly. The pilot performance went relatively well too, with two issues of note. The first issue was significant and the second issue was minor. These are described below.

Issue one: The person who was supposed to control the subtitles did not show up or answer their phone when I called to see where they were. As we were relying on subtitles for people who did not speak isiXhosa to be able follow the play, this presented a problem. Shortly before the performance was supposed to start, a developer involved in the Siyakhula Living Lab stepped in as a replacement. The developer was not fluent in isiXhosa, but understood enough to be able to control the subtitles using a combination of the Interplay script and my high level help communicating the rough order of things that were supposed to happen.

Issue two: The play started early! The first actor came on stage and began his lines before we were able to introduce the play and its purpose. The purpose of the performance was to get the audience feedback and therefore the introduction and framing was important. As that particular character makes a drunk, stumbling entrance on to the stage, I was able to improvise and gently urge him off the stage

to make the introduction. Fortunately people reported thinking that it was part of the performance.

Following the performance, the audience members were invited to share their response to the play, ask us questions and provide any suggestions for improvement. The play, along with the open feedback session, were filmed. Overall, audience members responded very positively and made many useful suggestions. The widow of the artist whose story was used as inspiration was also happy and comfortable with the storyline.

The majority of the suggestions from audience members related to improving the subtitle experience. Suggestions were also made relating to improving the play from both an educational and experiential perspective too. A selection of the key suggestions made is outlined below in Table 21.

Table 21 Key suggestions for Interplay from Pilot #1

Category	Detail
Subtitles	Place an icon next to text with character head-shot thumbnail for easy reading of subtitles
	Character introduction at the beginning of the performance for ease of use of subtitles and following the story - we can weave this into the play or do it explicitly
	Subtitles behind the actors for ease-of-reading
	Interpret rather than translate Xhosa humour in the subtitles - find an English equivalent to funny Xhosa things, or something close at least
Music	Music when audience enters, and during scene changes
	Adding music in the final scene
Education	Possible question and answer session following the play regarding the internet
Narrative/ script	Additional scene with Webster to show what he is doing several months later, as well as Fafa. Perhaps they meet again somewhere to discuss how the internet has helped them? over food again? or something else more active
Stage presence	More movement on stage to make it more interesting visually
Collaboration	Involve drama department more closely
Technical	Add a second projector to project pictures

After the pilot performance a meeting was held where the writing team discussed the suggestions made by audience members. Each suggestion was discussed extensively in addition to considering our own reflections and ideas for how to improve the performance. Following this, modifications were made to the script and performance with suggestions being applied where feasible and considered appropriate by the team.

The two most significant changes were the addition of a new cast member and a new scene at the end of the performance. The new scene was set several months in the future and detailed how one of the key characters, Webster, was able to use his knowledge of the internet to sell things he had made.

6.3.2 Pilot #2

A second pilot performance was held to test and validate the significant changes made after the first pilot performance. The second pilot also provided the opportunity for the Interplay cast to experience a full run through in front of a live friendly audience, before the public performance in a less controlled setting in the community.

The Computer Science, Drama and African Languages departments in addition to the Community Engagement staff were invited to view the second pilot performance. It was well attended, particularly with the staff and students from Computer Science and the Drama Department joining the audience.

As with the first pilot performance, feedback from the audience was both encouraging and primarily positive including appreciative feedback from the Head of the Drama Department. Minor updates to the play were made following the second pilot performance. The major outcome from the second pilot was confirmation that the play was on the right track.

6.4 Interplay performances

Interplay premiered in the Joza Township and was performed four times shortly afterwards at the 2012 National Arts Fringe Festival in Grahamstown. Following

these initial performances in 2012, Interplay has been performed over a dozen times in various locations and schools throughout the Eastern Cape of South Africa, and was performed again at the National Arts Fringe Festival in 2015.

This section describes the premiere performances in the Joza Township and National Arts Fringe Festival. Details of organising the performance at the Joza township and how the Egazini artists and other community members received it, are discussed in Section 6.4.1. The motivation behind, and outcomes of the performances at the National Arts Fringe Festival are then discussed in Section 6.4.2.

Image 41: Original Interplay cast during National Arts Fringe Festival program photoshoot at Thozi's house in March 2012

6.4.1 Interplay premiere at Joza Township

The first step organising the premiere performance of Interplay in the Joza township was identifying an appropriate venue. Thozi and the actors recommended Nolunthandu Hall in the Joza township as a good performance space to use. The municipality office in Grahamstown was supportive of us booking the hall, and approval was granted quickly after submitting a request in writing. Catering, in the way of several large platters and juice from the local supermarket, was arranged for the performance day for the Egazini artists, actors and community members. The provision of food for community members served as both an incentive and fringe benefit for people attending the performance.

The hall was booked at a specific time for two consecutive days. The first day was for set up and rehearsal and the second day was for the performance. Due to technical difficulties, a full rehearsal was not possible. In contrast to the positive pilot performances, the rehearsal performance was riddled with stress and a lack of confidence within the cast. Overall, the rehearsal felt like a disaster which led to concerns about the performance that was scheduled for the following day. However, that evening after a motivational pep talk and debrief of the rehearsal that took place over pizza, the day ended on a surprisingly positive note.

Around 100 local people, ranging from young primary school students, to the older Egazini artists, attended the performance at Noluthandu Hall the next day. A selection of audience members can be seen in Image 42. Unlike the rehearsal on the previous day, the performance ran smoothly and the actors were in their element. The biggest challenge was the significant echo in the hall that made it difficult to hear the actors from the back of the large hall. The challenging audio environment in combination with the time of day (afternoon) and length of the play contributed to an attrition in attention from the audience through the performance, particularly from the young children.

Image 42: Egazini artists and other audience members at the premiere performance of Interplay at Nolunthandu Hall

Two Rhodes University journalism students agreed to film the performance and subsequently decided to put together a feature on the play for Cue TV, the National

Arts Festival TV streaming station. The feature can be viewed at https://www.youtube.com/watch?v=oqRmo4Nc4hg. Following the performance, several interviews took place with the actors, Egazini artists and members of the community. Both Egazini artists and community members responded positively to the play. The Egazini artists expressed a renewed enthusiasm to explore how they could sell their artwork online. For example, following the performance an Egazini artist shared:

> *"My hopes are to sell my products overseas, not only here in South Africa. This is my biggest wish. Not only to sell here, but to people overseas."*

In addition, several community members, as well as the actors themselves, expressed an interest in learning more about the internet.

6.4.2 Interplay at the National Arts Fringe Festival

Interplay was performed at the National Arts Fringe Festival primarily as an opportunity for the actors. However, further opportunities for the play resulted from its exposure in this public setting. An account of what was involved in the National Fringe Festival performances is provided below in addition to examples of two challenges and one opportunity that arose from these performances.

As previously mentioned, opportunities to provide benefit to the community members involved in my research, including the actors, were sought throughout all aspects of the project. In the case of Interplay, an opportunity for the actors was the potential to be involved in the National Arts Fringe Festival held annually in Grahamstown. An application for Interplay was submitted to the National Arts Fringe Festival to give the actors' exposure and for their experience. The performances at the National Arts Fringe Festival created an added incentive for actors to be involved in the play. This was helpful as the amount we were able to pay them for their involvement was minimal.

The application to the National Arts Fringe Festival contributed significantly to the scope of the play expanding over time despite its original intention primarily being

an opportunity for the actors. When the idea for Interplay was conceived, it was intended to be a single performance for the Egazini Outreach Project members and other interested community members, for example friends of the Egazini artists and Interplay actors. The application to the festival added the need for a structure and level of polish for the play that was greater than would have been necessary for a single, casual, local performance. It also heightened the level of anticipation, enthusiasm and excitement around the initiative, particularly for the actors and director.

Image 43: Opening scene of Interplay. Subtitles can be seen projected in the background.

Interplay was performed four times during the National Arts Fringe Festival and promoted through various sized posters in town (e.g. Image 38). There were challenges throughout the festival period, two which will be mentioned below. However, overall it was a very positive experience for everyone involved. The continued performance of Interplay beyond the National Arts Fringe Festival is also largely due to the opportunity that arose which will be described later in this chapter.

Challenge one: The first performance at the National Arts Fringe Festival was not very well attended and we realised that we would need more than posters and word of mouth to promote attendance of the play. Following this, more complimentary

tickets were drawn to enable access to the play in case the cost of the performance was a barrier to the local audience. Transport was also arranged for people to attend the performance from the Township as the performance venue was relatively far and difficult to get to from the Township. The combination of complimentary tickets and arranging transport helped boost the attendance significantly for the remaining three performances. Arranging transport is an example of one of the things to consider when holding performances intended for socioeconomically disadvantaged communities.

Challenge two: On the day of the third performance, there was a blackout at the venue. Festival staff recommended that we cancel the performance. However, we decided to go ahead and perform without power. This decision was made because travelling from the township to the performance venue was a significant undertaking and we did not want to disappoint the people who had already made the effort to travel to the venue. We were also aware of many people who intended to come to the performance, but who would probably not know about the blackout until they arrived at the venue. In addition, this particular performance was almost sold-out and promised to be the best attended out of all of the performances. One hour before the performance was scheduled to begin, we organised portable lights to light up the stage and were prepared to proceed without power. A couple of minutes before the play was scheduled to start, the power was luckily restored and we were able to go ahead with the performance as previously planned.

The blackout on the evening of one of the performances is mentioned in this thesis for two reasons. Firstly, it is an example of one of the many things that happened that affected my plans and required a flexible response. Secondly, the loss of power, scheduled or unscheduled, can be a relatively common occurrence in locations where ICT4D projects are based.

Image 44: Linda, the actors and I after the third performance of Interplay at the 2012 National Arts Fringe Festival in July

Opportunity: There was a breakfast gathering for producers and directors of performances during the 2012 National Arts Fringe Festival. At this gathering I met a representative from the Swallows Foundation who expressed interest in Interplay. The Swallows Foundation, (Swallows Partnership 2016), is an arts and culture partnership between the North East of England and the Eastern Cape of South Africa. The representative from the Swallows Foundation was interested in the potential for Interplay to be used for communicating the possibilities the internet offered to schoolchildren. We exchanged details and subsequently arranged for Interplay to be workshopped with professional actors. Several months later, the Swallows Foundation sent professional actors to spend a week with the actors in Grahamstown. During this week, they provided mentoring with their acting, and worked with the actors to revise the play for a school audience. Several, mostly minor, changes were made to the script. The most significant changes were a livelier opening scene and a song about the internet at the end of the performance which was composed by the actors. Following the workshop with professional actors, the updated version of Interplay was performed at several local schools in the Grahamstown townships and featured in the local newspaper.

Image 45: Interplay being performed at a local school following the workshop with the Swallows Foundation

Image 46: School children watch an Interplay performance following the workshop with the Swallows Foundation

6.5 Reflecting on the Interplay experience

From the beginning, I received strong support from the Siyakhula Living Lab team and my peers for the idea of using storytelling to communicate the possibilities and limitations of the internet, and felt confident that it was an idea worth pursuing. I also recognised that it would probably require significant work. However, I completely underestimated both the amount of effort it would require and the nature of the impact it would have. For example, when I first began to

create the play, I did not realise that it would absorb the majority of my remaining time in South Africa. On a more positive note, I also did not anticipate that it would be adapted for school children and then continue to be performed after I left South Africa.

Throughout the process of creating Interplay I came to appreciate the significant gap between an idea and the reality of executing that idea successfully. I experienced many hurdles throughout the process, most of which were resolved. A limitation of research cycle C was that the impact of Interplay was unable to be assessed in an in-depth and rigorous way because I had already extended beyond the time limits of my PhD candidature. This section is an account of some of the learnings from the process of producing Interplay, including what worked in Section 6.5.1, and learnings in Section 6.5.2.

6.5.1 What worked

Three key aspects of the play that worked well were, 1: The use of storytelling to explore the possibilities and limitations of the internet, 2: The positive impact of the experience on the actors, and 3: The collaborative involvement of other departments at Rhodes University. These are discussed below.

Use of storytelling: The use of storytelling to explore the possibilities and limitations of the internet worked very well. People were generally entertained, engaged and learnt something new. The Egazini artists, the original intended audience, described their experience of the play both entertaining and educational. A surprising side effect of Interplay was some of the actors being approached by people in the community with questions about the internet following their performances. So by virtue of having been in a play about the internet, the actors were perceived as having expertise on the subject.

Positive impact on actors: The significant positive impact the play had on the actors was not anticipated. The actors not only felt that they learnt something about the internet through their involvement in Interplay, but the experience served as a catalyst for them to be involved in, and pursue other opportunities. For

instance, following the performances of Interplay in 2012, two actors decided to pursue further study, in part due to their experience with Interplay. Two other actors decided to write their own plays which they submitted to the National Arts Festival the following year in 2013.

Collaboration with other departments: The collaborative involvement of several departments at Rhodes University, in particular the Drama Department, was very helpful especially in the early pilot stages of the play. The time previously spent at Rhodes University during research cycles A and B, and the relationships developed during this time were key factors enabling the smooth process of engaging the Rhodes Drama Department. Having a Rhodes student ID, email address and having established relationships with various people at the university, all helped this process, which otherwise would have been harder or potentially not possible.

6.5.2 Learnings – or what I would do differently

Three key things I would do differently as a result of my experience producing Interplay are, 1: Shorten the length of the play, 2: Seek an appropriate (larger) budget, and 3: Arrange follow-up workshops. These are each discussed below.

Length of play: The play was too long! The length of the play was in part influenced by the National Arts Fringe Festival application, which provided suggested guidelines for the length of performances. However, the length, which was originally 50 minutes, pushed the boundaries of peoples' attention span. In hindsight, I would try to limit performances to 30 minutes.

Budget for play: There were significant expenses associated with the production of the play. These included food, props, costumes, and transport and the actors' pay. There were also expenses relating to the National Arts Fringe Festival including the application fee, hiring the venue, projector and screen. Due to the gradually evolving nature of the size of the initiative, I did not start out with any budget. Instead, expenses were covered over time through an allowance allocated to my PhD scholarship and the Siyakhula Living Lab. Now having an awareness of

the types of expenses that can be associated with the production of a play, I would explicitly look to secure a budget to ensure expenses could be appropriately covered and to be able to pay the actors a reasonable amount of money for their involvement. Although the actors were paid a lump sum for their involvement in Interplay, I didn't realise the amount of time the actors would spend rehearsing, or quite appreciate the significance of every rand until after all of the performances.

Follow-up workshops: The performances of Interplay at Joza Township as well as the National Arts Fringe Festival generated significant interest from people in the community wanting to learn more about the internet. If possible, it would be good to have educational workshops available for people who were interested in learning more. Interplay was able to successfully engage audiences and generate interest in learning more about the internet, however, it would have been better if we were able to provide people interested in learning more an avenue to do so. Another possibility could be to provide training for the actors so they would also be better placed to answer people's questions.

One additional interesting aspect to explore in the future would be how Interplay, as a method for engagement and education, could be adapted for other communities. These could include other communities around South Africa, as well as globally. That is, to explore if the general idea and script template could be used in other cultural contexts by translating the script and updating some of the story elements to include locally relevant examples.

6.6 Summary of research cycle C

The activities carried out in this final cycle of research focussed on the creation and performance of Interplay, an educational play exploring the possibilities and limitations of the internet. Chapter 6 provides a case study account of creating a culturally tailored method in an ICT4D project. This case study and the play itself helped to address the broad aims of research cycle C and are major contributions of my research.

The creation of Interplay enabled me to fulfil the first two research aims of cycle C, namely, aim 1C: Make a positive contribution to the Siyakhula Living Lab and related communities and aim 2C: Create an educational play so the Egazini Outreach Project artists can better understand the possibilities and limitations of the internet. How the three aims and five research questions were addressed in cycle C is outlined below.

Evidence to support ***aim 1C***: making a positive contribution to the Siyakhula Living Lab was that Interplay was not only useful for my research with the Egazini artists, but was used in other parts of the Siyakhula Living Lab. For example in 2013, the following year, Interplay was performed in the Transkei communities several times. It was also referred to as an example of a Siyakhula Living Lab initiative in grant and funding applications. Stakeholder interviews influenced my final project contribution of Interplay by establishing familiarity with the local and project context. In addition, the relationships I developed through this process enabled my access to the support I needed to pursue my desired research direction and produce the play. The production of Interplay may have been either significantly more difficult or impossible without the relationships that had been established.

The successful production and performances of Interplay fulfilled ***aim 2C***. Key aspects of creating the play were described in this chapter along with a selection of learnings. The Egazini artists reported that Interplay helped them have a clearer understanding of the internet and expressed renewed enthusiasm for designing an e-commerce application to help them sell their artwork online. The adaptation of Interplay for a school audience and subsequent performances of Interplay in township schools supported the use of Interplay as an educational tool beyond this project. However, further research is needed to validate its impact.

The third and final aim of this cycle, ***aim 3C***: ensure benefit to the community remains once my PhD research has been completed, was addressed in the wrap up and handover process after Interplay was performed in the following way. The project to design an e-commerce application to enable the Egazini artists to sell their artwork online was handed over to an Information Systems professor at

Rhodes University. Before I left South Africa, I introduced the Egazini artists to the Information Systems professor, who then continued to explore designing an e-commerce application with the Egazini artists with some of his students the following year. The students involved in the project contacted me periodically during their project for advice. In addition, I continued to stay in regular contact with the Egazini artists and provide support where I was able.

The production of Interplay was handed over to another PhD student, Mathe (Maema) Ntsekhe, who was part of the Siyakhula Living Lab, since it was in line with her research interests. Mathe played a critical role in being the local presence helping arrange the workshop that took place later in the year with the Swallows Foundation, and organising the logistics for the performances of Interplay in other township schools.

A reflection on the methodology and methods used in all three cycles of my research is provided next in Chapter 7.

7

Reflection on Methodology and Methods Used

This chapter reflects on the methodology and methods used in this ICT4D research, including the use of participatory approaches with a focus on participatory action research. A summary of the seven key methods used and their contribution is also included.

These reflections contribute to the dialogue on methodology and methods used in ICT4D that can be referred to by future ICT4D initiatives and practitioners working in this area.

Chapter 7 contains reflections on the use of a participatory action research approach in a culturally unfamiliar, non-western ICT4D context. Summarises of the benefits and limitations of the seven key research methods used in the three cycles of research are also provided. This includes a reflection on the experience producing a play as part of a culturally tailored method to support mutual learning in ICT4D projects.

The chapter is structured as follows:

- Section 7.1 begins with a reflection on the participatory action research approach taken, and
- Section 7.2 provides an overview of the key methods and tools used throughout my research.

7.1 Reflection on participatory action research approach in ICT4D

PAR provides a useful framework that lends itself well to an ICT4D context. In particular, the emphasis placed on relationship building, contributing to affecting positive change in a research environment and adapting the research dynamically based on findings works well in ICT4D which often involves culturally-sensitive contexts. Trust can take time to develop in any community, but even more so with communities that may have been over-researched. The time taken to earn trust is an investment worth prioritising, especially where a researcher feels an ethical responsibility to at least attempt to leave the research context in a better shape than before they entered it.

There are, however, limitations to this approach such as the lack of specificity around project outcomes and amount of time required for relationship building and iteration that may prevent it from being feasible or the most appropriate approach for many projects. Even though applying PAR may not be possible, there are still valuable elements from this methodology that could be useful for other ICT4D projects to use. The rest of this section summarises the key benefits and strengths experienced in Section 7.1.1 followed by the key weaknesses and limitations of the PAR approach in Section 7.1.2.

7.1.1 Benefits of PAR

There were many benefits experienced using PAR. Three of the key benefits are described below under their respective headings:

1. In-built commitment to affecting positive change within the research context,
2. Emphasis placed on relationship building, and
3. Embedded responsiveness owing to the flexible, iterative framework provided by PAR.

In-built commitment to affecting positive change

A common characteristic of many projects, especially in ICT4D projects, is a power imbalance between researchers and the participants or community members. The power imbalance makes it very important for researchers to consider their ethical obligations and think about what participants will gain from being part of the research to ensure they are not taken advantage of. It is important for researchers to consider ethics because even if participants understand what they should be able to reasonably expect, they may not feel sufficiently empowered do anything about it or speak up. The power imbalance and necessary obligation of researchers to consider ethics is highlighted in Dearden's paper 'See No Evil? Ethics in an Interventionist ICTD' (2013) and was further emphasised in this research.

A key feature of PAR is having a positive impact in the research environment, so having a positive impact must be a central part of a project's aim for PAR to be an appropriate methodology. Making a positive contribution to the Siyakhula Living Lab was an aim in all three cycles of my research, however, exploring avenues to make a positive contribution required a significant shift from my original research focus. The PAR framework supported this shift and provided a valuable structure to support ongoing research design.

Having a positive impact is an intention of many projects, however, it is something that often gets inadvertently lost. Adopting PAR is one way that ICT4D projects

can ensure that the intention to make a positive impact remains a central part of a project, or at least remains visible throughout a project.

Relationships are central to the research approach

The central role of building relationships as part of PAR played a crucial role in influencing the success of my research. From a project perspective, building relationships within the Siyakhula Living Lab and the time taken to understand the Siyakhula Living Lab context were instrumental in devising a culturally relevant and useful contribution to the project. From the perspective of engaging the Egazini Outreach Project artists and the Interplay actors, the effort put into developing and nurturing relationships contributed to building trust between participants and enabled open dialogue.

Strong relationships with the Egazini artists were important for the artists to feel comfortable being involved with the Siyakhula Living Lab. The strong relationships also enabled the Siyakhula Living Lab to gain project-related insights in a culturally-sensitive way. My relationship with the Egazini artists were a crucial part of managing the process of communicating the change of my research focus and the subsequent handing over of the e-commerce part of the project to another professor. If we had not built trust, there would have been a greater risk that the artists may have felt mislead or even betrayed when I was no longer able to design an e-commerce application with them. For example, when a global NGO was late returning a selection of artwork they had borrowed from the Egazini Outreach Project, a couple of the artists approached me to help them. They felt upset and angry that this NGO had stolen their artwork and were unsure what they could do about it. After contacting the NGO, I discovered that there had been a miscommunication regarding the return date of the artwork and the NGO arranged to return the artwork as soon as possible. If the relationship between the NGO and the Egazini artists had been stronger, the artists would have been less likely to so quickly feel like they had been betrayed. Without trust and a strong relationship, the nature of the township context made the Egazini artist's sensitive to the idea of being taken advantage of by outsiders.

Relationships also played a large role in actors feeling empowered to contribute to shaping the Interplay script and eventually taking ownership of the production. Throughout the process of producing Interplay, the actors were encouraged to offer their ideas for changes to the script. They were initially hesitant, but over time, gradually became more involved in shaping the play. The increased sense of ownership played a significant role in the play continuing to be performed after I left in July 2012, for example the performances in 2013 and beyond. In the performances after I left South Africa, several actors took leadership roles arranging rehearsals and motivating the rest of the group without involvement from either myself, the director, Thozi, or the PhD student, Mathe, who I handed the play over to.

Flexible, iterative framework

Built into PAR is the notion that a research plan will be iterative and will likely undergo several cycles. This embedded responsiveness is particularly useful when conducting research in unfamiliar and complex contexts where there are many 'unknown unknowns' that may affect a project and its outcomes. In addition, any number of relevant research tools and methods may be used, including culturally tailored approaches. The flexibility built into the iterative framework and the research tools that can be used enables researchers to be more responsive to the context.

The explicit cycles of action research approaches proved to be a valuable 'tool to think with' throughout the research informing both research planning and its ongoing development. For example, the in-built questioning of the impact of findings on the research plan in PAR supported the two significant changes in my research direction and plans. The significant shift in direction from designing a mobile health application to the eventual aim of producing an educational play about the internet would have been a lot more difficult, or potentially not possible, if a more rigid methodological approach had been used. The cycles enabled me to close off one direction of research and replace it with one that was more appropriate in the project context. In ICT4D projects, this flexibility significantly increases the chances of a project having a positive impact on communities

involved as researchers are encouraged to update their plans in response to research findings.

7.1.2 Limitations of PAR

The benefits of PAR used in my ICT4D research outweighed its limitations. However, there were five key limitations experienced that I would like to share. Interestingly, these limitations relate to the additional overhead intrinsic to the major strengths PAR brought to the research project. These limitations are discussed under their respective headings:

1. Difficulty specifying project outcomes upfront,
2. Time needed to build relationships and immerse in context,
3. Relational work required to earn flexibility,
4. Ethical conundrums regarding personal relationship building and research, and
5. Emotional toll and impact on researcher.

Difficulty specifying project outcomes upfront

A part of PAR outlined in Figure 3 (in Chapter 3) begins with the setting up of relationships and diagnosis of problems. This is followed by planning what to do, doing it, evaluating the outcome, specifying the learnings and then starting the cycle again. While diagnosing and investigating the problem and then potentially changing research directions based on findings is part of the research process, it can be difficult to state what the overall project outcome will be upfront.

For example, in my research, the production of an educational outreach play was not an outcome that was anticipated at the beginning of the project. Rather, it was something that emerged as part of the second phase of the research. This resulted in a significant shift in research focus that meant that the original aim of designing a mobile health application was not met. Given the significant shift in focus of the research, it would have been impossible to anticipate the project outcomes at the beginning of the project. Projects and funding bodies often require project outcomes and associated milestones be specified upfront. Accommodating the

lack of certainty around the outcome that is characteristic of many PAR projects is more difficult, or may not be possible to accommodate, especially within the context of a commercial project.

Time needed to build relationships and immerse in context

Building and maintaining relationships can take significant time. This is often not accounted for in project plans due to restricted timelines and budgets. Despite this being an inherent part of the PAR methodology used in my research, it was still difficult to justify the amount of time invested upfront as part of understanding the South African project context and building relationships. One of the reasons why it was difficult to justify the amount of time spent on building relationships was not being able to quantify or define how strong relationships would contribute to a more positive project outcome. However, the benefits of investing time in building relationships and understanding the context could be identified and articulated in retrospect.

This thesis demonstrates the role of social relationships in shaping and influencing the value of a project contribution that can be used as a case study to support investing time towards building relationships in other ICT4D projects. In this context, an example of a contribution to the project from the research was the production of an educational play that could be reused for other initiatives within the Siyakhula Living Lab, as well as in other projects in general.

Relational work required to earn flexibility

Many benefits of applying PAR require a level of flexibility throughout a project that is difficult to support, especially outside an academic or postgraduate research context. A major reason is that project sponsors, or funding entity, often need to know what the outcome for their financial support will be upfront and expect certain milestones to be met throughout a project as evidence of progress towards this larger aim or outcome. Even though this is very reasonable in both an industry and academic context, if a project is going to be truly responsive to the context and shaped by research findings as they surface, project teams and sponsors need to be open to changing directions.

The willingness of a project team and sponsors to change a project's direction can rarely be assumed. In my research, a significant amount of relational work was required to enable the successful negotiation of changing research directions based on my findings from both the project leader and my supervisor. It also required sharing evidence of progress or output where possible, for example, the stakeholder interview findings, to help reassure my project sponsors that I would be able to deliver something.

Using a PAR approach presented a greater degree of risk and uncertainty regarding the outcome than the use of other more traditional approaches. Risk and uncertainty are factors that are uncomfortable for most people and not all project sponsors and teams may be willing to accommodate the degree of risk and uncertainty that exists in many PAR projects. However, building relationships and trust, not only with research participants, but with project teams and sponsors, can be instrumental in earning the necessary support to negotiate changes in research directions. If all parties involved in my research did not have the appropriate trust or willingness to be flexible regarding my final research output, applying a PAR methodology may not have been possible.

Ethical conundrums regarding personal relationship building and research

The relational aspect of PAR helped surface an in-depth understanding of the Egazini artists, actors and project team members involved in my research. This was a key and powerful component in my research. However, the relationships also presented ethical conundrums. This has especially been the case in the writing up and reporting of the research. For example, when there were situations that were a significant part of my research story, but could be compromising to the people involved if reported, I have found myself weighing my ethical responsibility to people versus the contribution to the ICT4D community and authentic reporting of my research. One of the strategies I used to help achieve this balance, was to give people involved in my research the opportunity to review either sections of my writing, or the whole thesis before its submission.

Emotional toll and impact on researcher

There were many positive and rewarding aspects taking a PAR approach in this research. However, a difficult side effect of the heavily relational side of PAR was the emotional toll and impact, especially in the face of loss and other people's challenging personal circumstances. For example, a key enabler to making a relevant contribution in my research was building relationships and trust with the Egazini artists. Through this process, I formed genuine relationships with the artists, which were mostly very rewarding.

Something that I hadn't considered before I started my research in South Africa was the possibility of losing someone involved in my research. Both at the time of my research and several years afterwards, four out of the six Egazini artists passed away and most due to circumstances hard to conceive of in Australia, for example dying due to diarrhoea. The relationships and bonds formed throughout the research didn't cease at the completion of my research in 2012. They have continued to this time of my writing, several years later, and the impact of the seemingly unnecessary loss of life has not been easy.

Overall, despite the challenges in the face of loss, the positive aspects of the relational side of PAR far outweigh the negative aspects. However, the potential emotional toll and impact on ICT4D researchers adopting a PAR approach is important to mention, if for no other reason than to ensure researchers set up the appropriate infrastructure to support themselves for these types of potential challenges.

7.2 Reflection on methods and tools used in this research

This section provides an overview and reflection on the experience of using seven key research methods in the three cycles of my research. The seven methods used according to each research cycle are listed below. These are:

Cycle A: Stakeholder interviews, fieldwork and contextual immersion, language lessons, local media review and viewing performances,

Cycle B: Introductory workshops, fieldwork and informal site visits, disposable cameras as cultural probes, and

Cycle C: Educational theatre.

A brief description, summary of benefits, limitations and general discussion of their use are included under their respective headings in sections 7.2.1 to 7.2.7.

7.2.1 Stakeholder interviews

Stakeholder interviews are a method commonly used in the social sciences to capture the various perspectives and expectations of stakeholders, people who have a stake, in a project. In my research, stakeholder interviews were administered to 25 key stakeholders involved in the Siyakhula Living Lab using a semi-structured interview guide. The main areas covered included capturing stakeholders agendas, visions for the Siyakhula Living Lab, perceived benefits, reservations and success criteria. Findings in each of these categories were coded and are available in Chapter 4, along with a selection of quotes that help to illustrate these findings. A summary of the strengths and benefits, weaknesses and limitation, and general discussion of the use of stakeholder interviews in my research are provided under their respective headings below.

Benefits of stakeholder interviews

The benefits of conducting stakeholder interviews are discussed in more detail in Section 4.5, but are summarised here. These benefits experienced were:

- **Something to do** – Stakeholder interviews were a great entry point into the project.
- **Scaffolding for relationship building** – Stakeholder interviews provided a reason for engaging and forming relationships with people in the project who may otherwise have been difficult to access or contact, particularly when they were very senior.
- **Facilitating transition from outsider to insider** – Relationships developed through the interviews and the activity itself helped me transition from a project and context 'outsider' to one of the team.

- **Identifying supporters** – Helped to identify like-minded people that could support future potential initiatives.
- **Collecting supporting evidence** – Gathering perspectives and evidence in a formal, structured way contributed to a body of 'evidence' or data to support suggested project directions.
- **Informing methods** and **informing future project directions** – A combination of findings from the interviews as well as time spent in the project shaped both the future project direction as well as the methods used for the rest of the project.
- **Informing project team and new members of the project** – Findings from the interviews helped keep the project team up-to-date with current perspectives on the project as well as provided information to inform new members.
- **Material for marketing and publicity purposes** – Benefits and evidence of success articulated by stakeholders could be used both of current marketing purposes as well as for future related funding applications.

Limitations of stakeholder interviews

- **Comprehensive analysis can be very time consuming** – A thorough, comprehensive analysis of the interviews took many months and did not yield significantly different findings from a much faster and lighter analysis of the data, or at least not enough to justify the additional time taken to do the thorough analysis.
- **Time and budget** – Face to face, contextual stakeholder interviews with stakeholders in various geographically dispersed locations incurred a significant cost, both in terms of travel time and travel costs.
- **Access to participants** – Where there is a large and diverse range of stakeholders from a variety of high profile positions and geographically dispersed locations, it can be difficult accessing their time and meeting them face to face.

General discussion and reflection of the use of stakeholder interviews

Conducting stakeholder interviews was the first formal research activity carried out for my thesis and lay the foundation for building relationships with project members and understanding the nuances of the large, complex project I had joined. The initial high level analysis revealed many of the key findings that shaped my later research. For example, interviews with community members made it clear that my original intention of developing a mobile health application was not realistic in a limited timeframe and that the Siyakhula Living Lab had limited engagement with community members from the Mbashe region. This meant I needed to reconsider my project contribution and my research aims. Findings from the stakeholder interviews were also able to influence the Siyakhula Living Lab project. For example, after being made aware that some students from the Siyakhula Living Lab were making false promises to community members, a workshop and further training was subsequently organised to prevent this from continuing to happen.

Stakeholder interviews are a very useful activity with benefits that can be realised by periodic repetition in long-term projects. This is especially the case where a project team is growing quickly or there is a relatively high turnover within a project team. Conducting stakeholder interviews periodically could help project teams understand their new members, manage stakeholders' expectations and increase the chances that peoples' success criteria are met. Stakeholder interviews also lend themselves to a variety of timeframes and budgets as useful insights can be gained from limited data analysis.

7.2.2 Fieldwork and contextual immersion

Fieldwork, like stakeholder interviews, is a common method used in the social sciences, participatory design, CSCW, HCI and many disciplines in the humanities. Fieldwork was carried out throughout all three research cycles, particularly in research cycles A and B, with only minimal informal fieldwork to the Egazini Outreach Project in cycle C.

Contextual immersion overlapped significantly with fieldwork and involved spending time in South Africa, at the university, in communities in the former Transkei and at Egazini Outreach Project. These are where the majority of fieldwork took place for this research. Initially, field notes and photos were the primary data collection methods used. For the fieldwork with the Egazini artists, a more systematic and formal approach to capturing the experience, insights and questions was applied through setting up a Google Docs spreadsheet that was updated after each interaction with the Egazini artists.

Fieldwork enables observation to take place and access to data that does not solely rely on people's subjective account of an experience. It also facilitates an additional level of empathy with a research project's environmental and social context, and enables relationships with participants to develop. Fieldwork can also involve significant travel, can be dangerous and can take significant time. It can be logistically difficult, expensive and challenging to organise access. It can also expose researchers to emotionally trying situations, which may have personal repercussions. However, there is no substitute for directly engaging with a context when trying to understand people, places and their needs.

7.2.3 Language lessons

I began receiving private tuition in isiXhosa, the most commonly spoken first language in the Eastern Cape Province, in the scoping phase of my research. The lessons continued through research cycles A and B. Tuition involved working through an intensive short course designed for academics at Rhodes University with one of the African Language tutors.

Language lessons are not usually part of ICT4D projects, nor are they generally spoken about as a method. Language lessons have been included in this section because of the insight they provided into this previously unfamiliar cultural context as well as the value local language played in facilitating the forming and building of relationships in the project. Although my Xhosa language skills remained basic during my time in South Africa, having at least a basic grasp of the language was very useful for my research. However, it can be very difficult learning

another language as it requires time and access to someone who can, and is willing, to provide lessons. This is not always feasible.

7.2.4 Local media and performances

Local media and performances used to inform my research included the local newspaper, fiction set in the area or close to the area of research, theatre, music and dance performances by local artists, and films or television shows set in the Eastern Cape of South Africa. As Allan Kellehear says in The Unobtrusive Researcher:

> *Culture is all around us. Taking time to study some of this material can offer rewarding social insights, contribute to policy formulation or social criticism and generate fertile theories or hypotheses for further testing or debate. (Kellehear 1993, p. viii)*

Engaging with the arts and media provided an additional, entertaining and engaging way of further understanding a cultural context, gaining a deeper empathy into a new cultural context and an interesting reference for discussion with local people.

When engaging with media and the arts, it is important to remember that it is being presented through the lens of one or one group of people's perspective and cannot be digested uncritically as the authority about a place or group of people. It can also be time consuming and expensive to find 'good' media and art that provide useful insights into a culture.

7.2.5 Introductory workshops

Introductory workshops were arranged with the purpose of the project team and project participants getting to know each other both personally and professionally. In this research, introductory workshops consisted of several members of the project team and the Egazini artists gathering together over food. There were five introductory workshops held in total, during which two to three people shared their personal stories. The artists and project members were asked to share their stories starting from where they were born, through to where they currently lived,

and to bring any relevant photos or props that would assist this. The richness of the stories shared by the Egazini artists provided a unique insight into their lives and histories as shared earlier in Chapter 5.

Introductory workshops were a great platform for sharing stories, building relationships and trust and gaining both personal and cultural insights into the participants and their cultural context. However, the workshops were time consuming and better suited to small groups. Introductory workshops in larger groups, for example when the Egazini artists met the Siyakhula Living Lab project team, were more difficult to coordinate, and may have unintentionally excluded some participants. Despite this, even the large introductory workshops were still useful for gaining a higher level overview.

One aspect to keep in mind when running introductory workshops, whether large or small, is that participants can vary in how comfortable they are with sharing their stories. Therefore, some informal relationship building may need to take place before workshops to maximise the benefit from the sessions for the broader group.

7.2.6 Cultural probes

Cultural probes were used in research cycle B in the form of disposable cameras given to the Egazini Outreach Project members. Cameras were given to members and two copies of the photos taken were printed, one copy for the artist and one copy for the project. I was not very prescriptive in how the cameras were to be used and encouraged the Egazini artists to take photos of things they did, things they liked and essentially whatever they wanted to.

Benefits of cultural probes

The Egazini artists enjoyed using the disposable cameras and the photos taken gave the project team insight into their daily lives. The disposable cameras were a perceived benefit to the artists, who did not have access to affordable printing of photos. The cameras provided a simple way that participants were able to mutually benefit from a research exercise.

Disposable cameras as cultural probes also helped gain insight into certain aspects of the artists' lives that would not have been possible otherwise. For example, one of the artists captured several stages of a circumcision ceremony, (Images 18 and 19), which would not have been open to outsiders.

Limitations of cultural probes

A couple of the Egazini artists struggled to use the camera, for example, one the artists was only able to utilise a third of the film because the camera jammed. Even though the disposable cameras as cultural probes provided interesting insights into the artists' lives, they were most useful to supplement other data, but would not have sufficed as stand-alone method.

7.2.7 Educational theatre

The use of theatre as an educational tool has been applied for many decades, particularly in the area of health (e.g. Gosh et al. 2006 and Denman et al. 1995). However, there are limited examples of the use of theatre for ICT4D projects. Using storytelling to pass on knowledge however, is a central part of how the Xhosa people shared knowledge traditionally. Interplay is an educational play that explores the possibilities and limitations of the internet through several interwoven stories of people based in the Joza Township, a Township adjacent to Grahamstown. The play contains three acts and is performed by six actors with a basic set. A comprehensive account of Interplay is provided in Chapter 6.

Benefits of educational theatre

Using theatre for education was an accessible, entertaining way for the audience members to learn about the possibility and limitations of the internet. Key strengths of this approach experienced are elaborated below.

- **Accessibility** – The play provided information in a way that was accessible to members of the community regardless of their educational background or exposure, thereby providing an inclusive way of sharing knowledge.
- **Engaging** - Theatre performance was a powerful way of capturing the interest and curiosity of people who may otherwise not have been interested

in learning about the internet. Audiences of all ages ranging from school children, through to elderly artists claimed to enjoy the performances.

- **Contextual relevance** – Community members could see the different possibilities the internet could offer them in an easily relatable way.
- **Ongoing relevance** – The fact that the play continued to be performed several years after its initial performances and its performance outside the project context is evidence of the ongoing relevance of the production.
- **Local tangible benefits** - The theatre performance provided several actors with an acting opportunity and the potential to earn an income in a place where employment opportunities were very limited.

Limitations of education theatre

The biggest limitation of the use of theatre for education was the complexity of putting together an educational play. It can be difficult and time consuming producing a theatre performance. Although this may be obvious to anyone with a drama background, as someone unfamiliar with drama, it was not obvious to me at the time. When producing a play, there are also many risks and things that can go wrong that are good to be aware of. However, the potential benefits to the project and community make it a method worth considering and exploring in other future ICT4D projects.

An additional limitation was that for people other than the Egazini artists who viewed the performances, there was no easy way for people to find out more about the internet. Educational performances would benefit from the availability of follow up workshops, or an avenue for interested parties to find out more. In this project, the actors were often approached by people who wanted to know more about the internet, as they were looked to as experts. A partnership between the play and workshops held by the Computer Science Department at Rhodes University are currently being explored as well as potentially providing further technical training to the actors.

A final limitation of this approach is its dependence on access to appropriate and relevant writers, directors and actors. This is particularly the case for smaller, more

isolated communities. Fortunately in my research, access to appropriate writers, directors and actors was not an issue, as there were many of all three in Grahamstown and the townships in Grahamstown. One of the contributing factors to the presence of many writers, directors and actors in the area is likely because the National Arts Festival and National Arts Fringe Festival is held in Grahamstown annually.

General discussion and reflection on educational theatre

The production and subsequent performances of Interplay demonstrated some of the potential positive contributions the use of theatre for education can provide and was powerful as both a tool for education and engaging people. Experience of using theatre for education in this research builds on the successful use of drama in work done by Light et al. (2010) using performed personas and supports further use and investigation of the use of theatre and drama in cross-cultural projects.

However, although there are many potential and realised benefits of the use of theatre for education that were experienced in this project, it is difficult, time consuming and potentially expensive to put together a production. These factors limit the amount and type of projects it could feasibly be used in.

8

Contributions and Conclusion

This final chapter provides a summary of the research and its outcomes. The aims and research questions are revisited, along with core findings and the key contributions. Finally, a brief post-script to the research is provided and areas for potential future work suggested.

This thesis introduces the term 'culturally tailored', commonly used in the medical literature, to the field of ICT4D and advocates for the greater use of culturally tailored approaches and methods in the ICT4D field. In an ICT4D setting, 'cultural tailored' refers to the consideration of cultural and social contexts when choosing research and design methods and deciding how to apply them in an ICT4D project. This includes adapting existing methods for the cultural context of the project, as well as creating methods specifically for a project's context. Findings from this research support the claim that the explicit recognition of a culture's beliefs, values and behaviours in the choice and use of methods will increase the chances of an ICT4D project having a positive impact and reduce the risk of doing harm to communities.

The thesis also presents an example of the creation of a culturally tailored method for design, the development of an educational play about the internet that supports mutual learning and enables meaningful participation in the design process. Reflecting on the process that led to the decision to create an educational play about the internet, producing the play and arranging the performances highlights the crucial role of the time spent immersed in the South African context in enabling the play to be successful and to have an ongoing positive impact.

The time spent in South Africa allowed:

- Immersion in, and time to learn about the cultural context. This then enabled me to gain a stronger sense of what was significant for the cultural context of the project,
- Building networks and relationships that I could to draw on throughout the project,
- Identifying the potential theatre may offer as a tool for education and engagement, and
- Recognition of the importance and value of regular face to face contact with project participants.

Chapter 8 provides an overview of the main contributions of my research. It is made up of the following sections:

- Section 8.1 revisits the aims and research questions,
- Section 8.2 summarises the main contributions,
- Section 8.3 provides a brief post-script to my research,
- Section 8.4 puts forward some suggestions for future work, and
- Section 8.5 provides some concluding remarks.

8.1 Revisiting the aims and research questions

The aims and research questions for each of the three research cycles will be revisited in this section. A description of how they were addressed is provided under their respective headings.

8.1.1 Research cycle A

There were three aims and five research questions in research cycle A.

***Aim 1A**: Make a positive contribution to the Siyakhula Living Lab and its related communities.*

Making a positive contribution to the Siyakhula Living Lab was a basic aim that continued across all three cycles of research. In research cycle A, the desire to make a positive contribution provided the impetus for the change in research direction and triggered research cycle B based on findings. The lack of strong engagement between the community in the Mbashe region and the Siyakhula Living Lab instigated a search for local opportunities where a stronger engagement might already exist or could be developed as part of the research.

***Research question 1A**: What are the agendas, visions, perceived benefits, reservations and success criteria of key stakeholders in the Siyakhula Living Lab?*

The agendas, visions, perceived benefits, reservations and success criteria of key stakeholders involved in the Siyakhula Living Lab were recorded and analysed. The findings were presented in Chapter 4.

***Research question 2A**: What are potential opportunities for me to contribute to the Siyakhula Living Lab?*

At the end of research cycle A I identified the opportunity to create an e-commerce application with artists from the Egazini Outreach Project located in the Joza township, Grahamstown. In addition, exploring different ways of engaging community members in both the Siyakhula Living Lab and the design of an application were identified as potential ways to contribute value to the Siyakhula Living Lab.

***Aim 2A**: Familiarise myself with the South African context.*

The amount of time spent conducting stakeholder interviews, doing fieldwork in the Dwesa area of the Mbashe region and primarily being based in Grahamstown during research cycle A enabled me to develop an understanding of the South African context and feel more comfortable being there. The initial time spent in South Africa was a key part of later being comfortable with the idea of working in a township. The level of comfort, understanding and familiarity with South Africa enabled the research in cycles B and C to take place, which would otherwise have been not possible, or significantly more difficult.

***Research question 3A:** What cultural factors need to be taken into account when identifying suitable research methods in South Africa?*

One of the most significant findings from research cycle A was the critical role of relationships and building relationships with people when engaged in research with socioeconomically disadvantaged communities in South Africa. The critical role of relationships applies to both the Siyakhula Living Lab project team, as well as community members participating in the research. The significance of family and hierarchy became clear, as well as a different relationship to time compared to many Western societies. In South Africa, people commonly use the phrase 'just now', for example when describing when they will next see someone or get around to a task. 'Just now' does not mean immediately, as it may mean in Australia. In South Africa 'just now' means later, with no indication of whether that will be in a

few minutes, hours, days, weeks or even months. The popular use of this phrase is just one example of how peoples' perception of time differed in a South African context compared to an Australian context.

In addition, the large wealth disparity, the low levels of education and the persisting negative effects of the previous apartheid governments on community members, especially in rural areas, were also very apparent. These factors contributed to an increased awareness of the power imbalance between community participants and researchers, the need for flexibility, especially regarding time, and the need to build in time in the project for developing rapport, trust and relationships when engaging community members.

***Research question 4A**: What is the potential role of ICTs for delivering services to communities in South Africa?*

The prevalence of mobile phones and the widespread availability of mobile reception offered significant opportunities for ICTs to be used to deliver services to socioeconomically disadvantaged communities in South Africa. However, even though the technology was available and accessible, there was a gap in understanding effective ways to engage community participants in the design of solutions, as well as a gap in the appropriate education for community members to enable their meaningful participation. The recognition of these gaps provided the foundation of the eventual shift from designing an application to designing a tool for engagement and education.

***Aim 3A**: Design a mobile health, (or other service), application for communities in the Mbashe region of the former Transkei as part of the Siyakhula Living Lab.*

Mobile phones and access to mobile phones were available in the rural Mbashe region of the former Transkei. However, the lack of engagement by community members in the Siyakhula Living Lab, along with the challenges travelling to and living there led to the adjustment of aim 3A in the next research cycle (cycle B) to aim 3B: designing an e-commerce application for the Egazini Outreach Project artists.

***Research question 5A**: What are the challenges designing technology for socioeconomically disadvantaged communities in a culturally unfamiliar context?*

One of the most significant challenges identified research cycle A was how to generate interest from community members to participate in co-designing solutions. However, other challenges associated with the actual design of technology for socioeconomically disadvantaged communities in South Africa were not explored in cycle A. An approach to generating interest from community members to co-design solutions was explored and validated later in research cycle C through the production of Interplay.

8.1.2 Research cycle B

There were three aims and eight research questions in research cycle B.

***Aim 1B**: Make a positive contribution to the Siyakhula Living Lab and related communities.*

This fundamental aim continued to inform my research decisions in research cycle B. In particular, it explains why research cycle B was short and why the direction of research cycle C shifted to creating an educational play about the internet.

***Research question 1B**: How can stakeholder interviews influence an ICT4D project contribution? and,*

***Research question 2B**: What are the benefits of conducting stakeholder interviews in ICT4D projects?*

The usefulness of conducting stakeholder interviews in research cycle A led to the addition of research questions 1B and 2B in both research cycles B and C. They enabled ongoing reflection on the impact that conducting the stakeholder interviews had on the rest of my research. The ways in which stakeholder interviews influenced my project contribution, as well as the benefits of conducting stakeholder interviews are described in Chapter 4 and again in Section 7.2.1 of Chapter 7.

***Research question 3B**: What are potential opportunities for me to contribute to the Siyakhula Living Lab?*

I started out research cycle B viewing the design of an e-commerce application for the Egazini artists as a way I could contribute to the Siyakhula Living Lab. However, early in my engagement with the Egazini artists I identified the gap in their understanding of the internet. The identification of this gap and the investigation of how storytelling could be used to address it was the catalyst for the transition of the research to the next cycle (cycle C). The creation of an educational tool to describe the internet to the Egazini artists became the focus of my contribution to the Siyakhula Living Lab and the main part of my final research cycle (cycle C).

***Aim 2B**: Familiarise myself with the Egazini Outreach Project context.*

In research cycle B, the local context I sought to become familiar with was the Egazini Outreach Project and the contexts within which the Egazini artists lived and worked. The research methods I used and findings from the research are presented in Chapter 5.

***Research question 4B:** What cultural factors need to be taken into account when identifying suitable research methods for understanding and engaging the Egazini Outreach Project artists?*

The main cultural factors that needed to be taken into account when doing research with the Egazini artists was the significance of building relationships for both trust and comfort being involved in the project and the different levels of formal education the artists had received. In addition, the importance of family, of being transparent and 'fair' and the level of hardship experienced by members of the Egazini Outreach Project were common and relatively typical within the township context. Some of these hardships are particularly visible in the stories the artists shared about their background presented in Section 5.3 of Chapter 5.

***Research question 5B**: What are the needs, motivations and familiarity with technology of the Egazini Outreach Project artists?*

The primary motivation of the Egazini artists to sell their artwork online was to be able to sell more artwork. In part owing to their location in the township, the Egazini artists struggled to sell their artwork despite the local and international recognition of its quality. The limited, even lack of understanding of the internet became apparent in the introductory workshops held with the Egazini artists and motivated the creation of an educational play about the internet in research cycle C.

***Research question 6B**: What is the potential role of ICTs for providing a useful service for the Egazini Outreach Project artists?*

In part, due to the change in research focus early in research cycle B, this research question was not explored in detail. However, early findings supported ICTs potential to help the Egazini artists sell their artwork. In order for an ICT to be helpful and sustainable to the Egazini artists, other considerations beyond the technology itself are important. For example, if the Egazini artists were to sell their artwork online, they would also need support or training on how to send their artwork locally and internationally as well as how to handle the transfer of money, to name only the most immediate areas.

***Aim 3B**: Design an e-commerce application for the Egazini Outreach Project artists to sell their artwork online.*

Research cycle B began with the intention of designing an e-commerce application, however early findings lead to a change in focus. Therefore aim 3B changed from the design of an e-commerce application in cycle B, to aim 2C: the creation of an educational play for the Egazini artists, in cycle C.

***Research question 7B**: What are the challenges designing technology for socioeconomically disadvantaged communities in a culturally unfamiliar context? and,*

***Research question 8B**: How can methods used in participatory design be adapted to give Egazini Outreach Project artists a meaningful voice in the design of an e-commerce app to sell their artwork online?*

Challenges associated with the actual design of technology for socioeconomically disadvantaged communities and the adaptation of participatory methods were not explored due to the fast transition to research cycle C.

8.1.3 Research cycle C

There were three aims and five research questions in research cycle C, the final research cycle.

***Aim 1C**: Make a positive contribution to the Siyakhula Living Lab and related communities.*

In research cycle C, the most useful contribution to the Siyakhula Living Lab and Egazini Outreach Project I identified was to create an educational play about the internet to engage community members and enable meaningful participation in future co-design activities.

***Research question 1C**: How can stakeholder interviews influence a project contribution? and,*

***Research question 2C**: What are the benefits of conducting stakeholder interviews?*

In cycle C, the most significant benefits from the stakeholder interviews were the relationships and trust that I was able to continue to build on and benefit from research cycle A. These enabled the activities conducted in research cycle C to be supported by the Siyakhula Living Lab, Rhodes University and the local community.

***Aim 2C**: Create an educational play so the Egazini Outreach Project artists can better understand the possibilities and limitations of the internet.*

The play was successfully developed and performed. In addition, the artists reported a better understanding of the internet and increased enthusiasm to explore how they could sell their artwork online.

***Research question 3C**: What is involved in producing an educational play for a non-English speaking audience?*

Details about the play and the major aspects involved in its development, production and performance are described in Chapter 6.

***Research question 4C**: How will the theatre piece for education and engagement affect the Egazini Outreach Project artists understanding of the internet?*

In part due to the amount of time it took to produce Interplay, evidence supporting the effect of Interplay on the Egazini artists' understanding of the internet is limited to anecdotal evidence. The anecdotal evidence supports that the play was helpful for their understanding. However, further investigation was not possible within the various constraints of my research.

***Research question 5C**: What are other potential uses for the educational play? and,*
***Aim 3C:** Ensure benefit to the community remains once my PhD research has been completed.*

Research question 5C and aim 3C are discussed together as they both relate to activities that followed my formal research engagement. One of the potential uses for the educational play that emerged following my research was its use for educating school children about the internet. The handover of the research in the hope of ensuring benefit to the community and the performance of Interplay to school children is described later in this chapter in Section 8.3.

8.2 Contributions

The major contributions of this thesis are methodological. In particular it:

1. *Demonstrates the value of conducting stakeholder interviews in an ICT4D project.*

The value of conducting stakeholder interviews, particularly in large collaborative ICT4D projects was investigated and supported. In particular, the findings of my research included insights into the way stakeholder interviews influenced making a relevant contribution to an ICT4D project. In addition, nine broad categories of the additional value stakeholder interviews added to my research that may be useful to other ICT4D projects were identified.

The stakeholder interviews also captured the wide and varying ways that different stakeholders defined success. The many ways of defining what constitutes a successful project found in my research provides evidence supporting the large diversity of metrics that people and organisations will use to assess the success of a project or initiative. Explicitly capturing these metrics through stakeholder interviews is one of the ways that a project team can improve their chances of meeting their stakeholder success criteria or manage their expectations where needed.

2. *Demonstrates the role of social relationships in enabling active participation in an ICT4D project.*

Social relationships played a key role in both enabling my research to take place and supporting ideas for the alternate research directions in research cycles B and C. In particular, the relationships with the project team at the Siyakhula Living Lab and the Egazini artists proved crucial to the successful completion of the project.

The key people involved in enabling my research to take place are illustrated in Figure 5 and discussed in Chapter 3. The role of relationships, with both project and community participants, for shaping and influencing my research has been

discussed throughout my thesis and demonstrated in my findings chapters (chapters 4 to 6).

3. *Demonstrates how cultural factors influenced the choice and use of methods in an ICT4D project.*

The research context, especially the cultural context of the research participants, played a key role in shaping the choice and use of methods in this ICT4D project. Understanding the local cultural context, in particular when working with the Egazini artists in research cycles B and C, informed how methods were chosen, tailored and used. An account of how and why several culturally tailored research methods (including introductory workshops, informal site visits and using disposable cameras in the spirit of cultural probes) is provided in Chapter 5. Chapter 5 also provides the foundation for the creation of the culturally tailored educational play, Interplay.

4. *Provides a case study of the creation of a culturally tailored method to support mutual learning in ICT4D.*

The main tangible output of the three research cycles was Interplay, an educational play about the internet for an amaXhosa audience who may speak little or no English. Interplay was created because storytelling is the traditional way of passing on knowledge for the amaXhosa, and I was able to explore a *culturally tailored approach* to educating the Egazini artists about the internet.

An account of the production of Interplay is presented in Chapter 6 that contributes a case study of the creation of a culturally tailored method that can be used to enable meaningful engagement and mutual learning in ICT4D projects.

Finally, Interplay itself is a tangible outcome and contribution of this research. It continues to be used to enable learning about the internet and its potential use with communities in the Eastern Cape Province of South Africa. One of the performances of Interplay, with English subtitles, is provided with the hard-copy version of this thesis.

8.3 Research journey wrap up and post-script

The relationships that were fostered over a period of three years did not cease immediately following the completion of my research in South Africa in July 2012. The following section describes the evolution of relationships, nature of contact and account of Interplay following my departure from South Africa.

8.3.1 Handover of relationship with Egazini Outreach Project for e-commerce application

Towards the end of my research it was important to identify people who could continue the engagement with the Egazini Outreach Project to ensure the sustainability of the project. This was particularly important once it was clear that the delivery of an e-commerce application to help the Egazini artists sell their artwork online would not be possible within the scope of my research. Several possibilities were considered before identifying a lecturer from the Information Systems Department at Rhodes University, who was both interested in the project and with whom the Egazini Outreach Project members were happy to work. In 2013 the lecturer and group of his students worked with Egazini artists to design an e-commerce application. However, despite the best of intentions the project was not implemented.

8.3.2 Handover / shared responsibility of the continued performance of Interplay

Interplay demonstrated potential to be useful as a tool beyond an educational piece to explain some of the possibilities and limitations of the internet to the Egazini Outreach Project artists. However for this to be realised, I knew it was important to set up a local champion. This was particularly important given the amount of effort involved in organising the performances. Two local champions were identified. These were 1: Mathe (Maema) Ntsekhe, a PhD student from the Siyakhula Living Lab who had helped with performances and expressed interest in this role as she was personally interested and felt that it aligned with her thesis topic and 2: Alfredo Terzoli, the director of the Siyakhula Living Lab also agreed to support the play both for personal and professional reasons.

Mathe helped to coordinate performances in the second half of 2012 and throughout 2013 while she was at Rhodes University. This included coordinating the workshops with the Swallows Foundation in October 2012. Alfredo continued to provide support for Interplay when requested by either myself, Mathe or the actors. The support of Mathe and Alfredo enabled the infrastructure for Interplay to continue to be performed in schools.

Interplay not only had an impact on viewers of the performance, it had a significant impact on the actors. The involvement in the performance was a catalyst for several of them to pursue further education, including finding out more about computers and what technology could offer them. Within the Township, they were seen as experts on the internet, which inspired them to continue learning so they could answer people's questions.

8.3.3 Continued relationship with Egazini artists and Interplay actors

The deepest relationships that I formed were with the Egazini artists. Since leaving South Africa in July 2012 I have maintained contact with the Egazini artists intermittently and I continue to be contact with them now (at the time of final submission in 2019). I have also visited them on my trips back to South Africa and spoken to them on the phone on average once every three months. Unfortunately, in the years following the completion of my research, four of the six artists who took part in this research passed away and the remaining artists are too frail to continue going to the Egazini Outreach Project location. However, I still maintain contact with the two remaining Egazini artists and have been in contact with an additional former Egazini artist who is looking to be involved in the Egazini Outreach Project again. With the passing of Vux in 2017, who was managing the Egazini Outreach Project's operations, I have been exploring different ways to either help them continue or help transition the remaining two artists out of the Egazini Outreach Project.

Ongoing support of the Egazini Outreach Project has been provided where appropriate and possible, for example helping to fund their exhibitions at the 2015, 2016, 2017 and 2019 National Arts Festival and occasionally purchasing material

for their artwork. In 2015, for the first time, Egazini did not receive municipality funding to have an exhibition at the National Arts Festival because the local municipality had been placed under administration. The Egazini artists turned to me to ask for help with their application and I agreed to support them secure an exhibition space if they were unable to obtain other funding.

In July 2014 I built a Wordpress brochure page for the Egazini Outreach Project to promote their exhibition at the 2014 National Arts Festival. The website can be found at www.egazinioutreachproject.com. I plan to expand the site through several phases. In addition to maintaining contact with the Egazini artists, I also continued to periodically maintain contact with many of the actors originally involved in Interplay.

8.4 Future work

This section will suggest seven areas of potential future work following my research. The first five relate to Interplay, and the sixth and seventh relate to the field of ICT4D. These are described under their respective headings below.

1. *Combine Interplay with workshops or education sessions*

   Future work could include combining performances of Interplay with workshops or education sessions. This would enable interested people to find out more about the internet and other technology following each performance.

2. *Provide actors with computer training*

   Computer training could be provided to the actors to better enable them to answer questions people may have if they get approached by interested people after their performances.

3. *Adapt Interplay for other communities*

   Anecdotal evidence and the continued performance of Interplay after my research supports the interest and potential usefulness of the play for engagement and education. Future work could explore if the Interplay

template, that is the core story idea and concept, could be adapted for other communities.

4. *Interplay as a tool for mutual learning for project members and stakeholders*
   Interplay could potentially be used not only to give community participants a better idea of the possibilities and limitations of the internet, but to provide project members and stakeholders of the Siyakhula Living Lab with insights into the township context. Watching a subtitled version of the play may help the project team and stakeholders develop a stronger sense of empathy with both the township context and how people in the township may relate to the internet and other technology.

5. *Evaluate the impact of Interplay*
   Future work could involve evaluating the impact and effectiveness of Interplay in a rigorous way. For example, this could include conducting a series of interviews and administering a survey to audience members following each performance, in addition to carrying out a longitudinal study evaluating the direct and indirect influence of Interplay over time.

6. *Consider a common terminology for culturally tailored ICT4D*
   Currently, there are several different ways of describing what I have called a *culturally tailored* method or approach in the ICT4D field. Establishing a consistent way of describing methods and approaches that are tailored for the cultural and social context in ICT4D could help to build a more coherent body of work. For as long as it is an uncommon approach and researchers and practitioners continue to apply different labels, it will be more difficult for the approach to gain momentum and be more widely recognised by the ICT4D community. Based on the precedence set in the medical literature and the overlap in the intention of use, I propose the use of the term *culturally tailored ICT4D*. However, rather than the term itself, the priority is gaining consensus on what to call it within the group of researchers who use it.

7. *Investigate the transcultural bridging work undertaken from community members engaging with international researchers and projects teams in ICT4D projects.*

   This research focussed on the recognition of a culture's beliefs, values and behaviours in the choice and use of methods in ICT4D projects. However, a significant area that I did not explore in my research is the amount of transcultural bridging work that is required on behalf of communities participating in ICT4D projects and their expectations of international researchers and project teams. Understanding the transcultural bridging work done by community members is an important part of understanding how relationships are negotiated across cultures and represents an interesting research aim.

8.5 In closing

This research demonstrates that exploring ways to design *with* communities, as well as seeking to understanding and respect the role of culture and context can increase the chances of making a positive contribution in ICT4D and reduce the risk of unintentionally causing harm.

The thesis outlines the journey of how taking a participatory action research approach, investing in building relationships and prioritising making a positive contribution shaped a project from its original plan to design a mobile health application, to the production of an educational play about the internet that continued to be adapted and performed for several years after the research completed.

Investing time in understanding the cultural and social context of an ICT4D project, building relationships with people and using culturally tailored research methods, each contribute to increasing the chances of good intentions leading to good outcomes. Ivan Illich, (1968), may be right that good intentions alone do not help anybody, but in an ICT4D context applying participatory methodologies and culturally tailored methods help to make good outcomes more likely.

Image 47: Linda, the actors and I after the final performance of Interplay at the 2015 National Arts Fringe Festival

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Appendix

1. Stakeholder interview guide

Date: Organisation: Interview no:
Location:

Siyakhula Living Lab Stakeholder Semi-Structured Interview Questions

1. What is your organisation? What is your role in the organisation? And how does it relate to the Siyakhula Living Lab?

2. How long have you been involved with the Siyakhula Living Lab and/or Dwesa initiatives?

3. (i)What is your understanding of Siyakhula Living Lab? - What do you think the project is in your own words?
   a. Who is involved?
   b. What is the purpose?

   3 (ii) - For ESTIMA Stakeholders - What is your understanding of ESTIMA (eServices and Telecommunications Infrastructure for Marginalised Areas) project?
   a. Who is going to use it?
   b. What is it going to do?

4. What do you see are the benefits coming out of the project? (e.g. for the community)
   a. What problems do you see this solving?

5. Do you have any reservations about the project?
   a. What do you see as some of the risks to the project success?

6. What role do you see yourself playing in this project?
   a. What do you feel you are/ can contribute?
   b. What role would you like to have in this project?

7. What do you personally hope to see out of this/ gain out of this?

8. What does your organisation hope to see out of this/ gain out of this?

9. How would you determine if this has been a successful project? e.g. what are the criteria it would need to fulfil to be seen as a success?

10. What is your vision for the project?

11. Any other thoughts, comments, questions?
   a. Is there anyone else that you think should be involved? or would be interested in being involved?

Glossary

amaXhosa	The Xhosa people
CSIRO	Commonwealth Scientific Industrial Research Organisation
HCI	Human Computer Interaction
HCI4D	Human Computer Interaction for Development
ICT	Information and Communication Technologies
ICT4D	Information and Communication Technologies for Development
isiXhosa	The Xhosa language
MDG	Millennium Development Goals
OLPC	One Laptop Per Child
PAR	Participatory Action Research
PD	Participatory Design