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Understanding the Impact of Free Public WiFi Hotspots using the Choice Framework

Submitted
by
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To the Faculty of Commerce, Law and Management, School of Economic and Business Sciences, University of the Witwatersrand in partial fulfilment of the requirement for the

Master of Commerce in Information Systems degree
(Coursework)

Supervised by
Professor Judy Backhouse

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Keyword*: Free Public WiFi Hotspots, WiFi, Impact, Development, CoJ, The Choice Framework, ICT4D***.**

ABSTRACT

Background – Information and communication technologies (ICTs) are said to bring with them a promise of addressing developmental challenges. The debate about the potential contribution of ICT to development is still controversial with limited empirical results to back it up. While there is currently published literature on the role of ICT in social change and development, there exists limited empirical evidence that supports the impact ICTs have on social change and development. This study builds on these existing concerns and tries to understand how free public WiFi hotspots that have been rolled out in the City of Johannesburg (CoJ) impacts the development of city residents.

Purpose – The purpose of this study was to explore and better understand the impact that free public WiFi hotspots have on the development of City of Johannesburg residents, and determine if any development at all was experienced.

Design/methodology/approach – This study was guided by the interpretivism paradigm where an inductive approach was employed. The Choice Framework was utilised to theoretically underpin this study. This study followed an explanatory research approach where qualitative research design was employed. This cross-sectional study used non-probability sampling, where convenience sampling technique was selected as the appropriate sampling method for the study. Semi-structured open-ended interviews were conducted with twelve respondents in the City of Johannesburg.

Practical implications – This study provides an understanding on how Information and Communications Technology for Development (ICT4D) projects, in this case, the free public WiFi hotspots rolled out in the City of Johannesburg impacts the development of the city residents. This research will enable ICT4D researchers and practitioners to better understand how these ICT4D initiatives are impacting the development of residents. This study will also help ICT4D project implementer to ensure that any barriers to the impact of free public WiFi hotspots on development is addressed to ensure that the CoJ addresses residents' development needs. The study will provide direction that will guide ICT4D projects implementers on how to better roll out more of these WiFi hotspots in other parts of the CoJ and how to better address residents' development challenges through free public WiFi hotspots.

Findings – The study found that the availability of free public WiFi hotspots is various locations in the CoJ region does positively impact the development of residents, however, development is a choice. Only those who chose to use the free public WiFi hotspots will be able to achieve the development outcome to achieve the life that they value and have a reason to given the confines of their social structures. After all, it is only through the successful use of ICTs that real developmental benefits will be realised.

DECLARATION
University of the Witwatersrand, Johannesburg
School of Economic and Business Science
SENATE PLAGIARISM POLICY
Declaration by Students

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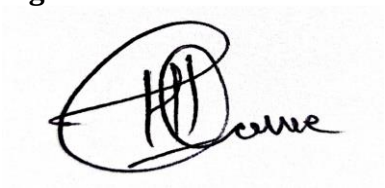

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Date: 28 February 2018

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Acronyms

ANT: Action-Network Theory

C4D: Communication for Development

CA: Capability Approach

CBD: Central Business District

CCT: City of Cape Town

CF: Choice Framework

CoCT: City of Cape Town

CoE: City of Ekurhuleni

CoJ: City of Johannesburg

CoT: City of Tshwane

D&M Model: DeLone and McLean model

DFID: British Department for International Development

DoC: Department of Communications

FPW: Free Public WiFi

ICT: Information and Communications Technology

ICT4D: Information and Communications Technology for Development

ICTD: Information and Communications Technology for Development

IEEE: Institute of Electrical and Electronics Engineers'

IS: Information Systems

IT: Information Technology

ITU: International Telecommunication Union

JDAs: Johannesburg Digital Ambassadors

Joburg: Johannesburg

Jozi - Johannesburg

Kbps: Kilobit per second

KZN: KwaZulu-Natal

LAN: Local Area Network

MB: Megabyte

Mbps: Megabits per second

MBs: Megabytes

QoL: Quality of Life

SEDs: Socio-Economic Development Programmes

SLF: Sustainable Livelihood Framework

StatsSA: Statistics South Africa

TOP: Theory of Practice

UN: United Nations

VAT: Value Added Tax

WC: Western Cape

WiFi: Wireless Fidelity

WLAN: Wireless Local Area Network

WTO: World Trade Organisation

Chapter 1: Introduction

1.1 Introduction to Chapter 1

Chapter 1 is an introductory chapter to the study. Firstly, the chapter provides a background and rationale of the study mainly focusing on the impact of Information and Communication Technology (ICT) on development, popularly known as Information and Communication Technology for Development (ICT4D). The problem statement is then introduced in the next section where the problem and the phenomenon under investigation are briefly described. The third part focuses on the purpose of the study followed by the objectives of the study where objectives, aims and research questions are broken down. The central research question and the secondary research questions are then presented. The context of the study is subsequently discussed. The chapter proceeds to present the intended contribution of the study, outlining the study's contribution to theory and the contribution to practice. The scope of the study is also discussed and finally, an overview of the entire dissertation structure is provided.

1.2 Background and rationale

Information and Communications Technology (ICT)

According to Alias (2013), Information and Communication and Technology (ICT) is a term used to cover all aspects of telecommunications, computer systems, and networks that allow information to be electronically captured, processed, stored and disseminated. ICT is not limited to the afore mentioned, this technology has brought the capability to revolutionize production, process, enabling decision making and directly impact people's lives (ITU, 2010). Wide range of literature exist that explains the benefits of ICT (Duncombe & Heeks, 2005; Avgerou & Madon, 2005; ITU, 2010 & Walshman, 2010) and literature on negative connotations associated with the use of ICT have been covered by some of the scholars (Heeks & Kanashiro, 2009; Weber, 2010; Sadok, Chatta & Bednar, 2016). When appropriately allocated, adopted and implemented, ICTs is said to be able to solve various developmental challenges that many countries are faced with. However, it is important to note that ICT is not a one-size fit all approach, it is just one element of the effort to change. With the promise to address a wide range of developmental challenges, the role of ICT is becoming widely accepted as an enabler to foster development for different countries and communities (Sein, Thapa, Hatakka & Sæbø, 2016). The use of ICTs to address development challenges has brought about a new research and field of study named Information and Communication Technology for Development (ICT4D).

Information and Communications Technology for Development (ICT4D)

ICT4D is an academic or a research field that primarily focuses on understanding the use of ICTs as an enabler to address wide range of development challenges. According to Walsham (2017), ICT4D is a field of research that can be tracked since the mid-1980s on the basis of the number of formal research

outputs published in journals or conferences. Historically ICT4D can be broken down into three periods namely ICT4D 0.0, 1.0 and 2.0. This history is briefly discussed in the literature review (Section 2.5). ICT4D studies are based on the assumption that ICT can help improve development challenges (Avgerou, 2010). While ICT4D is based on the use of ICT as an enabler for development, there currently is no agreed definition of development.

Definitions of development differ depending on field of study or context that it is applied in. The development concept has since progressed from its initial link with economic growth and modernization in accordance with Western standards to an inclusive view that recognises cultural differences, education, health and quality of life (Andrade & Urquhart, 2010). ICT4D mainly focuses on the use of ICT to advance people in communities, these communities are mainly found in developing nations and underserved regions (Alias, 2013). The main focus area of ICT4D in research and in practice is developing countries, due to the fact that these countries are home to materially disadvantaged societies (Walsham, 2017). ICT4D is part of a wider concern around enablers for development currently being addressed by researchers and international development agencies. ICT's role in promoting development is now accepted globally and has resulted in the debate moving from whether ICTs do contribute to development, to focusing on how and what type of development actually takes place (Sein, Thapa, Hatakka & Sæbø, 2016). This has resulted in the need for a comprehensive (holistic) impact assessment to effectively demonstrate ICT4D's impact on development and how that impact came about (Mthoko & Khene, 2018). A number of reports by international development agencies (e.g. World Bank, International Telecommunication Union) and researchers (Heeks & Kanashiro, 2009; Alias, 2013; Rislana, Good, Adams. & Scott 2015, Sadok *et al.*, 2016; Noor, 2018) continue to advocate for ICT as an efficient solution to the existing development difficulties, however some researchers are sceptical about the contribution of ICT to development (Sadok *et al*., 2016).

Contribution of ICT to development

ICT4D research mainly focuses on the use of IT infrastructures to bring about economic, social and human development. Most ICT4D projects or programs aim to improve people's lives without denying them their basic human rights and cultural values (Ojo, 2016). However, adoption does not equal impact; the availability of ICT does not necessarily imply positive development (Sadok *et al*., 2016). An intuitive appeal is made for a positive relationship that exists between ICT and development in developing countries. A study by Njoh (2018) found that there was a positive impact on development as a results of cell phone subscription in Africa, this supported the findings by World Bank (2012). Another study by Thapa, Sein and Sæbø (2012) found that a wireless project in the mountainous region of Nepal provided a remote village the ability to communicate. The report by ITU (2010) showed that internet access at home can improve education, the participation of women in the workforce and the

health of children. After all, real development benefits will only be achieved through the successful use of ICTs (ITU, 2010).

While literature shows that ICT contributes to development (Thapa, Sein & Sæbø, 2012), the nature of this development may vary. According to Thapa and Sein (2010) the process through which the impact of ICT on development occurs still remains unclear. Although it is well documented that ICTs can assist in fostering development, evidence to support this claim is limited (Mthoko & Khene,2018). Rislana *et al*. (2015) argues that evaluating the impact of ICT4D projects on development has been limited. Therefore, an understanding of the impact that ICT has on development and the nature of developmental outcomes as a result of ICT use is needed.

City of Johannesburg (CoJ) free WiFi hotspots, Gauteng, South Africa.

Given the role that ICTs play as a development enabler is now widely accepted globally, international development agencies like the United Nation, World Bank etc. have adopted ICT as one of the mechanisms that must be used to foster development. This external influence from these international development agencies, has ensured changes from the South African national, provincial and local governments, as they are embracing ICT as mechanism to address their development challenges. Various national and local governments in South African are exploring ways to improve the residents' development challenges through ICTs. The City of Tshwane (CoT), City of Cape Town (CCT) and City of Johannesburg (CoJ) have initiated and implemented free public WiFi hotspots across different locations within these cities. This is one of their initiatives among others change efforts to contribute to the development of city residents through the use of ICT to access the internet (Chigona, Mudavanhu, Siebritz & Amerika, 2016). Of the three cities, the CoJ government has placed emphasis on broadband infrastructure investments in an attempt to provide internet connectivity to the residents (Mutula & Mostert, 2010). This is a reactive action by the CoJ as the Internet demand keeps increasing in post-apartheid South Africa.

The increase in internet demand is as a result of the increase in smartphone usage in South Africa (SA) and globally. According to Statista (2017), total population of smartphone users in South Africa has been estimated at 18.48 million with a projected rise to 25 million by 2022. Internet usage remains relatively low despite the high number of smartphone users in South Africa. According to Goldstuck (2017), quarter of the smartphone user base cannot afford internet connectivity data, which then resulted in low internet penetration. A research study in South Africa by de Lanerolle, Walton and Schoon (2017), found that people depend on smartphones or mobile phones to access the Internet, if they do at all. Access to the Internet is through mobile currencies referred to in South Africa as airtime and data bundles and these currencies are often in short supply given the socio-economic challenges like high unemployment, poverty and inequality. Due to high cost of accessing the Internet, internet users have

developed strategies to minimise the costs of accessing the Internet by buying airtime and data in very small quantities, staying up late at night to make use of cheaper rates and leaving their data connections off except occasionally to check messages. According to de Lanerolle, Walton and Schoon (2017), some residents accessed the Internet through free public WiFi where free public WiFi hotspots have been implemented.

Alfreds (2015) argues that there are impacts on the resident where free public WiFi hotspots have been implemented. Internet usage in South Africa still remains low despite the benefits associated with internet access and connectivity. To address these challenges, the CoJ has investment in broadband infrastructure and managed to roll out over one thousand WiFi hotspots throughout the CoJ regions. This is among many other change efforts that the CoJ has implemented to improve various aspects of its residents. The CoJ hired approximately 3000 Johannesburg Digital Ambassadors (JDAs) to help this initiative by creating awareness by explaining the associated benefit from the broadband connections and training residents on how to utilize the rolled out free public WiFi hotspots. While there are benefits associated with access to the Internet, the benefits of free public WiFi hotspots that have been rolled out in the CoJ have not been deeply investigated and reported.

1.3 Problem statement

ICTs are said to bring a promise to tackle developmental challenges (Heeks & Kanashiro, 2009). The debate about the potential contribution of ICT to development is still controversial with limited empirical results to back it up. While a number of reports presented by international development agencies such as the World Bank (2012) and International Telecommunication Union (2010) continue to advocate for ICT as an efficient solution to prevail over development difficulties, some researchers are not as enthusiastic and have expressed scepticism about the association that ICT has on development (Sadok *et al*., 2016). Although literature exists claiming that ICTs are enablers for social change by encouraging development, there currently exists limited empirical findings supporting this claim (Rislana *et al*., 2015; Mthoko & Khene, 2018). It has been widely accepted in ICT4D research that ICT can assist in addressing development, however it remains unclear how this process occurs (Thapa & Sein, 2010). According to Rislana *et al.* (2015), there currently is limited literature that evaluates the impact of ICT projects on development. Although researchers like Heeks (2003), Thapa (2012) and others have conducted research to understand the outcomes of ICT4D, findings from these studies are not applicable to the CoJ, Gauteng, South Africa. The literature also shows that large amount of research in ICT4D and impact analysis of internet access on development has been conducted globally, however, there is no focus on the South African context, given the different developmental challenges experienced in South Africa.

According to Rislana *et al*. (2015), the lack of a universal development definition has limited how researcher evaluate the impact of ICT4D initiative on development. The way researchers conceptualise and understand development will impact the way they analyse and their understanding of impact.

Given the importance of ICT4D and what is currently known about the field, there are still some questions where limited evidence exists when it comes to ICTs and their impact on development. Walsham (2017:18) advocates for a shift to try and answer the following questions:

“

- To what extent are ICTs contributing to development?
- How can we extend the benefits of ICTs more widely in society and mitigate the negative effects of rich/poor divides, for example?
- How can researchers theorize what is happening in a compelling way?”

ICT4D research is constantly looking to answer the question of how ICT promotes development (Sein, Thapa, Hatakka & Sæbø, 2016). This research study will help Walsham (2017) in answering the first question, “to what extent are ICTs contributing to development?”.

According to Kleine (2010) ICTs, specifically the Internet, have been referred to as the ground-breaking inventions that continue to change the way people from around the world live their lives. However, researchers as well as practitioners in the field of ICT and development studies are struggling to present empirical results highlighting specific impacts of these technology. There exists wide literature on explaining why ICT projects fail that has enabled researcher and practisioners to get some form of generalisable patterns of failure, however the ICT4D community is still struggling when trying to legitimise the overall degree of the impact ICTs have on changing the lives of communities (Kleine, 2010). This research builds on these existing concerns and tries to understand how free public WiFi hotspots that have been rolled out in the City of Johannesburg impact the development of the CoJ residents. This research study will focus on free public WiFi hotspots as the IT artefact to try examining its impact on the development of the CoJ residents.

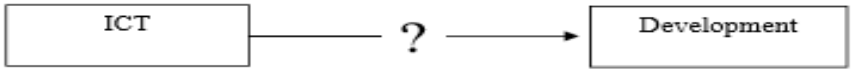

Figure 1: What is the link between ICT and development
Source: Sein *et al.* (2016)

1.4 Purpose of the study

The purpose of this study was to explore and better understand the impact ICTs have on the development of CoJ residents, in South Africa. For the purpose of this study, the ICT artefact that was studied is free public WiFi hotspots rolled out in various locations across the CoJ regions. This study explored how free public WiFi hotspots in CoJ public areas have impacted on development of city residents and determine if any development at all was experienced.

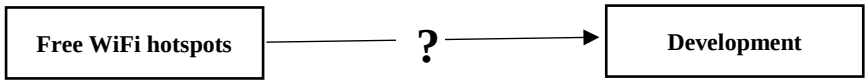

Figure 2: Link between free public WiFi hotspots and development
Source: Researcher concept

1.5 Objectives

The objective of this study was:

- The primary object of this study was to understand the impact, if any, of free public WiFi hotspots on the development of CoJ residents, as perceived by the residents.

The secondary objectives of this study were:

- To understand who uses the free public WiFi hotspots.
- To understand what the CoJ residents use these free public WiFi hotspots for.
- To understand whether free public WiFi hotspots have impacted on the development of CoJ resident and how the impact (if any) was experienced.

To address the above-mentioned aim and objectives, the following research question has been identified:

How does the use of free public WiFi hotspots impact development of City of Johannesburg residents, as perceived by the residents?

The research question above will be answered with the following sub-research question developed:

1. Who are the users of the free public WiFi hotspots in the CoJ?
2. What do residents of the CoJ use these free public WiFi hotspots for?
3. In what ways, if any, has the free public WiFi hotspots impacted the development of CoJ resident, as perceived by the residents?

1.6 Context of the study

This study was conducted in South Africa, in Gauteng province which is among 9 South African Provinces. This research study focused specifically on the City of Johannesburg (CoJ), the reason being that the CoJ government has placed emphasis on broadband infrastructure investments in an attempt to provide internet connectivity to their residents (Mutula & Mostert, 2010). Broadband infrastructure for the City of Johannesburg is well established as compared to the other South African cities. The province of Gauteng is the most populous in South Africa with an estimate of 14 million residents, with the City of Johannesburg being the largest city with an estimated 4.4 million residents (Statistics South Africa, 2011). 72.5% of the population in Johannesburg consist of a 'working age' (15-64 years old) group involved in different economic activities like education, employment or informal business. The CoJ's borders cover Midrand in the north of Johannesburg to the informal settlement of Orange Farm in the south of Johannesburg and from Edenvale in the east to Roodepoort in the west of Johannesburg. Giving the researcher a fair population sample to work with.

Like many cities in developing countries, the CoJ is faced with different developmental challenges that need to be addressed with different change efforts or initiatives. CoJ's socio-economic development status report in 2016 identified and prioritised 10 socio-economic challenges that need to be addressed. These socio-economic challenges included over population, poverty, inequality, human development index (HDI), unemployment rate, food security, HIV prevalence, access to basic services, life expectancy and GDP per capita. CoJ established different development initiatives that are aimed at addressing different developmental challenges. Among these initiatives, CoJ has invested heavily on broadband infrastructure in an attempt to provide internet connectivity to their residents (Mutula & Mostert, 2010). CoJ has investment in broadband infrastructure and managed to roll out over 1000 free public WiFi hotspots throughout the seven CoJ regions to provide its residents with free access to the internet. This study attempts to examine how these free public WiFi hotspots have impacted on the development of the residents, as perceived by the CoJ residents.

1.7 Intended contribution of the study

The United Nations Millennium Development Goals (MDG) has adopted ICT4D as one of the tools to assist the organisation's aim to eradicate poverty and hunger, foster gender equality, universal education, child health, maternal health, end HIV, promote environmental sustainability and foster global partnerships (Alias, 2013). Organisations like World Bank and International Telecommunication Union (ITU) also continue to advocate for ICT, as they believe that ICT provides efficient solutions to the existing development difficulties. However, there is limited literature supporting these statements

on how ICT impacts development, and what shape or form impact is experienced. This study aims to contribute to the body of knowledge by understanding the impact that free public WiFi hotspots in the CoJ has on development their residents. This study contributes to practice as well as the ICT4D research field. The study may assist policy makers to better understand how their initiatives are impacting the communities. The study contributes to the body of knowledge by presenting a study geographically based on a South African context. Most of the published research gives perspective of other developing countries, it will be help the ICT4D research field to have different regional perspectives.

1.8 Contribution to theory

This study adopted Kleine's (2010) Choice Framework (CF) to study the development impact of CoJ residents as a result of using free public WiFi hotspots. The development outcomes are dependent on how an individual combines "the 'resources' which give them agency and the 'structures' within which they operate". The study contributes to theory by also understanding how resources, capabilities, and outcomes captured in the framework (which present a holistic analysis) will help us understand the impact as well as getting an understanding of the impact from the perspective of the affected end users as impact in this case is a lived experience.

1.9 Contribution to practice

The study provides an understanding of the impact that ICT4D projects, in this case, the free public WiFi hotspots rolled out in the CoJ impact on resident's development. The research helps ICT4D researchers and practitioners to better understand how these ICT4D initiatives are impacting the development of residents. This study also helps ICT4D project implementers to ensure that any barriers to the impact of free public WiFi hotspots on development is addressed to ensure that the city meets residents' needs. The study provides direction that will guide ICT4D projects implementers on how to better roll out more of these WiFi hotspots and how to better address residents' development challenges through free public WiFi hotspots.

1.10 Scope of the study

This study was limited to:

- The study is only focused on City of Johannesburg free public WiFi hotspots as the infrastructure for the City of Johannesburg is well established as compared to the other South African cities.
- Only the City of Johannesburg residents in four regions (D, E, F and G) were sampled to be part of the study.
- The study followed a qualitative approach to allow understanding of context and meaning derived from users.
- Only residents and not system owners were included in the study, as the study was investigating impact from the perspective of end user (CoJ residents).
- The study adopted the Choice Framework to theoretical underpin the study.
- Open-ended, semi-structured interviews were used in this study to source data.
- The data collected were analysed using Atlas.ti computer software.

1.11 Chapter outline

Chapter 1: Introduction

Chapter 1 is an introductory chapter to the study, addressing ten different aspects of this research study. First, the chapter provides a background and rationale of the study, the problem statement, the purpose of the study, the objectives and aims of the study, research question were broken down. The context of the study is subsequently discussed, outlining the study's contribution to theory and the contribution to practice, the scope of the study and lastly an outline of the structure of the entire research report is provided.

Chapter 2: Literature Review

This chapter scopes and discusses existing body of knowledge relevant to the study.

Chapter 3: Theoretical Framework

This chapter firstly discusses the popular models, frameworks and theories used to study ICT4D. The chapter then introduces the theoretical framing for the study and presents a discussion on why a theoretical framework was adopted. The chapter explains the selected theoretical framework and justifies why the framework in question was selected as appropriate for the study. Background literature is presented to explain the characteristics of the theory deemed appropriate for the purposes of the study.

For the purposes of the study, The Choice Framework is selected as the framework that meets these requirements for the study.

Chapter 4: Research Design and Methodology

Chapter 4 discusses the research methodology and design selected to execute the study successfully. The ontological and epistemological assumptions selected for the study are presented and motivation on why they were selected is also presented in detail. The chapter also discusses the research methods and procedures for sampling and data collection. The chapter also highlights how issues of ethics and limitations experienced were addressed. The chapter also details how reliability and validity of the study were addressed.

Chapter 5: Analytical Procedure

This chapter discusses the analytical procedure followed in the study to analyse the empirical data collected.

Chapter 6: Results and Findings

This chapter discusses the results for the study. The finding from that data collected from interviews and the results of the analysis is also presented in this chapter.

Chapter 7: Synthesis, Recommendations and Conclusions

A conclusion to the entire study is provided in this chapter. The chapter firstly recaps the research objectives. The chapter follows by presenting answers to the research questions and a discussion on how each question was answered. The chapter then presents the contribution the study made to theory and to practice. A discussion on the relevance of the research methodology applied is presented. The researcher then presents limitations that were experience during the completion of the study. Recommendations derived from the findings are then presented and discussed.

Chapter 2: Literature Review

2.1 Introduction to Chapter 2

Existing body of knowledge relating to the phenomenon under investigation is presented in this chapter on the important concepts of the study. This chapter examines existing literature on the impact of ICTs on development and later focuses on the impact of internet connectivity on development. The study then examines various ICT4D initiatives implemented in South Africa specifically focusing on free public WiFi hotspots. The chapter proceeds to examine the maturity of ICT4D research in South Africa by examining existing ICT4D studies presented in the context of South Africa. The chapter provides a background on ICT4D and the conceptualisation and definition of development is presented.

2.2 Definitions of concepts

ICT - According to Alias (2013), the term ICT incorporates all forms of telecommunications, computing systems and networks that enable electronic processing of information from capturing to dissemination.

ICT4D - ICT4D refers to range of activity that involve the use of ICTs to foster the development of communities (Donner & Toyama, 2009; Venkatesh, 2018; Alias, 2013; Walsham, 2017). ICTs range from PCs, mobile phones, internet etc. In the ICT4D research field, ICT is viewed as an instrument for enabling development activities, which are broad in their nature, ranging from education, health, poverty, employment, income generation opportunities, political activism, government services etc.

Development - This paper adopts Sen's understanding of development that define development as "a process that expands the real freedoms that people enjoy, value and have reason to value" (Sen, 1999: 3). This definition takes the enabler perspective of ICT. According to Sein and Harindanath (2004) development is essentially related to the individual's enhancement of capabilities through empowerment and knowledge. These capabilities key to development are built through commodities (e.g. ICT) (Oxoby, 2009).

WiFi – WiFi stand for Wireless Fidelity. According to WiFi Alliance, WiFi is defined as the "wireless local area network (WLAN) product that are based on the Institute of Electrical and Electronics Engineers' (IEEE) 802.11 standards enable wireless networking between devices across the class-licensed 2.4 GHz spectrum band". Lehra and McKnight (2003) defined WiFi as the "popular name for the wireless Ethernet 802.11b standard for WLANs". Oxford Dictionary (2018) defined WiFi as "A

facility allowing computers, smartphones, or other devices to connect to the Internet or communicate with one another wirelessly within a particular area". In simple terms, WiFi is basically a technological platform that allows users to connect to the Internet using devices like smartphone, computer, audio devices and tablets without the need for them to be connected to internet wires. The non-dependency of WiFi on physical cable connection is the reason it is called wireless connectivity.

WiFi Hotspots - WiFi was defined above. A WiFi hotspot is basically the location or an area where WiFi access to the Internet is available to users. Geerdts, Gillwald, Calandro, Chair, Moyo, & Rademan (2016:7) define WiFi hotspot as "a service point from which WiFi is offered, usually public WiFi. Since the term can refer to a single access point, or a WiFi zone (consisting of multiple WiFi access points (Aps)) the term is used with caution in this report." WiFi hotspot is sometime referred to as WiFi zone. WiFi zone just like WiFi hotspots is basically an area covered by WiFi network spectrum. WiFi hhotspots are becoming very common in public areas such as parks, coffee shops, airports, hotels. Recently WiFi hotspot are accessible in public transport, such as taxis, buses and trains and other less obvious locations.

Free Public WiFi hotspot– This conceptual definition of free public WiFi hotspot is adopted for the purpose of this study. Free Public WiFi refers to WiFi hotspot that is provided by city or municipal government to users at no cost.

2.3 Information and Communications Technology (ICT)

According to Alias (2013), the term ICT incorporates all forms of telecommunications, computing systems and networks that enable electronic processing of information from capturing to dissemination. The afore mentioned definition is usually applied when ICT is applied as processing mechanism. However, ICT is not limited to the afore mentioned, this technology has brought the capability to revolutionizes production, process, decision making and development (ITU, 2010). This technology has infiltrated every nooks and corners of our lives, and this infiltration is very visible given the number of ICTs required on range of daily activities in government, business and individuals (Jin & Cho, 2015). A wide range of literature exist, focusing on the explanation of the benefits associated with this technology, presented in Table 1 below.

Table 1: Benefits of ICT

Benefits of ICT Use	References
Better communication.	Thapa *et al*. (2012)
Reduced inequality and digital divide	Avgerou & Madon (2005)
Enables economic growth and socio-economic development	ITU (2010); Walshman(2010)
Empowerment and sustainability.	Osman and Tanner (2017)
Improved quality of life	Noor (2018)
Improved digital literacy	Ferreira, Sayago & Blat (2016)

While the use of ICT is associated with many positive benefits, there are negative connotations associated with the use of ICT. The negative connotations associated with ICT are presented in Table 2 below.

Table 2:Negatives associated with ICT

Negatives of ICT Use	References
Downloading of pornography	Heeks and Kanashiro (2009)
Digital Inequality and Digital divide	Sadok *et al*. (2016)
Security and Privacy Issues	Weber (2010)

Given the positive effects and benefits associated with ICTs as discussed by many researchers (Avgerou & Madon, 2005, ITU, 2010; Walshman, 2010, Thapa, Sein & Sæbø, 2012; Osman & Tanner, 2017), international development agencies like the ITU, the UN and World Trade Organisation (WTO) have realised that ICT can be applied as an enabler in addressing development challenges that the world is faced with. These international development agencies have adopted ICTs among other tools and methods to address these development challenges. It is therefore important to note that ICT is only one element of many change efforts in international development.

According to Sein, Thapa, Hatakka & Sæbø (2016), the role of ICTs in fostering development in different countries is now widely accepted. This has then resulted in a shift when studying ICT4D, researchers are now moving from understanding whether ICTs have a direct impact when addressing developmental challenges, to getting a holistic understanding on how the impact of ICTs on development actually happens and the type of impact experienced. The use of ICTs for international development requires new technologies, new intellectual integration, new approaches to innovation and a different perspective of the world's poor (Heeks, 2008). The new phase has resulted in the establishment of a new field of study called ICT4D with the main focus on holistically understanding the relationship that exist among ICTs and development.

2.4 Information Technology for Development (ICT4D)

ICT4D is an acronym for information and communication technology for development (ICT4D). ICT4D is sometimes referred to as ICTD or ITD, these acronyms all stand for information and communication technology for development. According to Walsham (2017), ICT4D was firstly introduced in the 1980s with primary focus of applying information technology to developing countries to contribute to their development. The history of ICD4T is discussed briefly in the section below.

ICT4D research is mainly focused on the use of ICTs to address societal problems and grand challenges that the planet is faced with. According to Venkatesh (2018), ICT4D researchers do research that matters and changes the lives of the poorest people on the planet. ICT4D mainly focuses on the use of ICT to enable the communities and the people in communities mainly found in developing nations and underserved regions (Alias, 2013). The focus on developing countries is due to the fact that these countries are materially disadvantaged (Walsham, 2017). However, ICT4D is not only limited to developing countries, also developed countries still use ICT to continue with their development project. The emphasis is placed on developing countries given that development challenges that are impacting the communities' quality of live are widely visible and common across developing countries. Sadok *et al*. (2016) argues that ICTs and economic growth have a positive causal relationship for both the developed and developing countries. This brings to life the fact that ICT4D is not only realised in developing countries but can also be applied in developed countries context.

ICT4D is part of a wider range of tools that are being used as enablers to address development challenges and it has since gained the attention of many researchers and international development organisations. ICT4D agenda is aligned to the UN's MDGs. The UN's MDG aims to address the following development challenges: eradicate poverty and hunger, foster gender equality, universal education, child health, maternal health, end HIV, promote environmental sustainability and foster global partnerships (Alias, 2013). The ITU and WTO has reached a multilateral trade agreements and consensus that is shaping ICT4D priorities in different countries (Ojo, 2016). This is supported by the introduction of the Millennium Development Goals that have also placed focus on ICT4D and getting a holistic view of ICT's contribution to country's development beyond economic growth (Zheng, Hatakka, Sahay, and Andersson, 2018).

According to Heeks (2008), to address the UNs MDG, new approaches, new technologies, new intellectual integration, and a different view of the world's poor will have to be applied. Fortunately, ICT4D follow an inter-disciplinarity approach to address development challenges (Walsham, 2017). ICT4D is a multi-disciplinary research field that incorporates fields of study like information systems, development studies and computer science amongst many to address development challenges (Avgerou,

2010). The multi-disciplinary approach of ICT4D has to be applied when addressing different development challenges as different challenges will require different approaches. For example, health developmental concerns will require different ICTs as compared to education. The multi-disciplinary approach of ICT4D is visually presented in Figure 3 below.

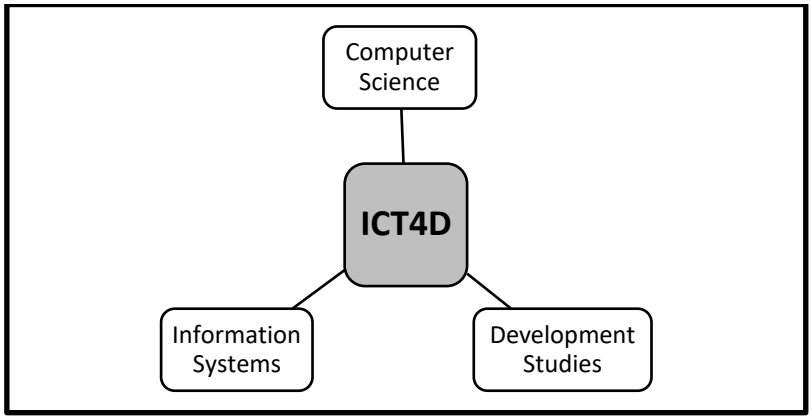

Figure 3: ICT4D as a multi-disciplinary approach.
Source: Heeks (2008)

Given the multi-disciplinary approach of ICT4D, ICT4D research field forms part of the broader research field called Community Informatics (CI). CI is the application of technology to improve user's quality of life, thus enhancing and supporting social structures (Noor, 2018). Stillman and Denison (2014:200) defined CI as "a domain of socio-technical theory and practice concerned to improve the lives of people in need". CI as a field of study is focused on ensuring that the well-being of the people and their communities is improved through effectively applying and using ICTs. CI's focus is directly aligned with ICT4D's agendas. According to Stillman and Denison (2014), CI focuses on analysing the socio-technical relationships that exist among communities and ICTs to enable social change and transformative action. According to Stillman and Denison, CI argues that ICTs success cannot be completely explained simply by focusing on the technical achievement, however social dimensions must be considered otherwise the success would be "radically incomplete". Below, a brief history of ICT 4D is presented.

2.5 History of ICT4D

ICT4D 0.0

According to Heeks (2008) the first computer to be installed and used in a developing country was in India back in 1956. Initially, ICT was mainly targeted at private sector and government for internal administrative functions of the public sector in developing countries. The ICT4D focus started in the 1980s where ICTs were transferred and diffused to developing countries in a form of "what works in developed countries will work the these developing countries" without considering the context of developing countries (Walsham, 2017). Avgerou (2010) pointed out that during this phase, ICT4D was mainly focused on the transfer and diffusion of ICTs to developing countries, without considering the conditions and social structures of that particular developing country.

ICT4D 1.0

According to Rangaswamy and Nair (2012) this phase started in the 1990s. This phase was enabled by the introduction of the Internet. During this phase, users from developing countries continued to be viewed as passive consumers. According to Heeks (2008), during this phase, ICT4D project sponsors and implementers focused replicating off-the-shelf solutions from developed countries, while implementing them in developing countries' poor communities. This phase was characterised by rolling out of telecottages or telecentres, even though ICT4D 1.0 was not only identified by telecentres projects, many initiatives included telecentres in this phase. Mostly in Africa, public libraries were used as telecentres. Noor (2018) defines a telecentre as public access computing centre where people can access various ICT related services for their benefit, usually at no cost. According to Walsham (2017) it was during this phase when researchers started to critique development and gender issues of ICT. Heeks (2008) noted that ICT effort during ICT4D 1.0 often resulted in failure of the projects, restriction which then led researchers to learn that sustainability, scalability and evaluation were important for successful implementation of ICT4D. Lessons learnt in this phase were carried over to ICT4D 2.0

ICT4D 2.0

A new phase based on the learning from ICT4D 0.0 and 0.1 emerged in the 2000s. Question started being asked on the nature of development ICTs, the role new technology was playing and a need for inter-disciplinary approaches of ICT4D (Walsham, 2017). According to Rangaswamy and Nair (2012), ICT4D 2.0 has been viewed by many researchers as a new approach to enable digital inclusion as developing countries and communities began to be viewed as active producers and innovators. ICT4D 2.0 redefined the framework of ICT tools around per-poor innovations rather than imposing pre-existing tools for developing countries to adapt (Heeks, 2008). Researchers used the learning from ICT4D 1.0

and started to look at ICT4D 2.0 and think more about sustainability, scalability and impact when ICT4D project are implemented (Mthoko & Khene, 2018; Heeks, 2008; Harris, 2016).

2.6 Transition of ICT4D

The history discussed above shows the transition of ICT4D over the years and the impact experienced in each period. The role of ICT in fostering development became widely accepted during ICT4D 2.0. Many of the ICT4D concepts and how ICT can be used as a development tool were discussed by Weigel and Walkdburger (2004) during ICT4D 1.0. Weigel and Walkdburger (2004) presented a framework of ICT4D showing the key dimensions and main goals of ICT4D, the framework is visually depicted in Figure 4 below.

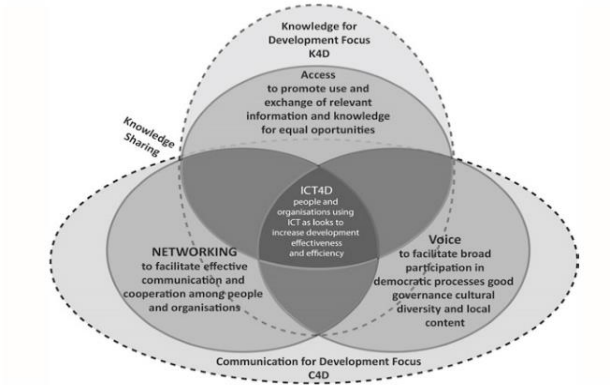

Figure 4: Weigel & Walkdburger's framework for ICT4D.
Source: Weigel & Walkdburger (2004)

Despite the positive role of ICT on development as presented by Weigel and Walkdburger (2004), some researchers argue that there is not enough evidence to support ICT4D's contribution to development. While many reports (e.g. World Bank, ITU) and researchers continue to advocate for ICT, as these organisations believe that ICT provides efficient solutions to the existing development difficulties. Not all researchers are as enthusiastic, some researchers are still sceptical about the contribution of ICT to development (Sadok *et al*., 2016). The scepticism from other researchers can be as a result of different meaning, understanding and definitions of development, currently there is no agreed universal definition of development. Definitions of development differs based on the field of study, as well as the context that it is applied. Definition of development for this study will be discussed in the next section.

While some researchers are still trying to prove that ICT play a role in development, ICT4D 2.0 researcher are now moving from understanding whether ICTs does impact development to understanding where the impact happens, how it happens and the type of impact experienced by users (Sein *et al*., 2016).

2.7 Definition and understanding of development

Development is understood differently by different people. There currently exist on universally accepted definition of development, as the definition differs based on the field of study, as well as the context that it is applied. Development in computer science means something completely different in the field of development studies. Andrade and Urquhart (2010) notes that the concept of development does no longer conform to the western standards that focused on economic growth and modernisation, it has since evolved to an inclusive view that that recognises cultural and social differences and takes in to account education, health, and quality of life.

According to Coelho, Segatto and Frega (2015), the concept of development is constantly being revised and discussed among authors from different academic disciplines due to complexities in defining the concept. In economics; development is usually associated with economic grown in the form of gross national product (GDP) and per capita income. However; scholars in different disciplines argue that economic view of development is inherently capitalistic as it doesn't consider the social and environmental aspect of development.

Research in 'development' space needs to provide answers to fundamental question of what is understood as development. According to Kleine (2010) debates in development studies were often addressed from a position that equate development with economic growth. However critical perspectives that moves beyond capitalist development ideas where uneven development, dependency and inequality are visibly present, is needed. Focusing on a development perspective that recognising social and ecological as well as economic goals.

While there are many researchers now focusing on ICT4D field with research question like "how specifically does ICT lead to development?". There is a more fundamental question that must be answers first, ICT4D researchers must firstly answer the question "what do we mean by development?" (Thapa *et al.,* 2012). An extensive review of this much-debated issue on what do we mean by development is beyond the scope of this paper, however the definition adopted for this will be discussed. The paper provides a few definitions of development below and the definition adopted for this study is discussed.

According to Sumner and Tribe (2008:9), "development is a concept which is contested both theoretically and politically, and is inherently both complex and ambiguous". Thomas (2004:1) also argues that "development is contested, complex, and ambiguous". The definitions of development in most cases adopt the limited meaning that is popularised by development agencies specifically aiming

at achieving UN's MDGs and reducing poverty (Thomas, 2004). The post-modern approach views development as a social construct that is embedded within certain economic aspect (Sumner & Tribe, 2008). Despite that integrated approach of the post-modern approach view development, there is still some confusion on differentiating whether development is an immanent process, unintentional process or an intentional activity (Cowen & Shenton, 1998).

Below are some of the descriptions and definitions referring to Development:

Oxford Dictionary (2018) firstly defines "develop" before defining "development". Develop is defined as "*grow or cause to grow and become more mature, advanced, or elaborate*". Development is therefore defined as "*the process of developing or being developed. A specified state of growth or advancement*".

Thomas (2004) defined development from that perspective popularised by international development agencies that views development as the achievement of the UN's MDGs.

Gore (2000:794) defined development from the 1950s and 1960s perspective where development was viewed as "a vision of the liberation of people and peoples' dominated, based on 'structural transformation". This perception on development has shaped the perspective on many contributors to the development literature.

Hickey and Mohan (2003:38) defined development from the post-modernists' position where development is viewed as a discourse that contributes to the reality and power relations where certain things are valued over others. This definition embraces the economics definition that considers people who lack materialistically as inferior.

Sumner and Tribe (2008) grouped the definition of development in to 3 categories, the categories are visually presented below in Figure 5.

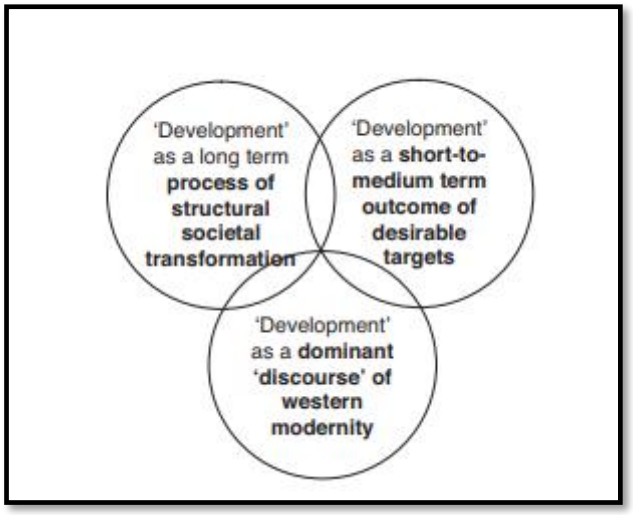

Figure 5: What is 'Development'?

Source: Sumner & Tribe (2008)

Development as a long-term process

Sumner and Tribe (2008) conceptualised development as process of structural societal change. This view was also defined by Thomas (2000, 2004) as a process that is focused on historical change. According to Sumner and Tribe (2008), the processes of structural societal change, being historical and long-term outlook are some of the key characteristics of this perspective. This perspective view major societal shift as one dimension based on the historical aspects. This perspective of development incorporates socio-economic structural changes like the organisation of production, ownership, the institutional structure, technology, and law (Sumner & Tribe, 2008)

Development as short to medium term target

The second conceptualisation of development by Sumner and Tribe (2008) defines development based on the timelines of goals aligned to performance indicators to measure the goals or outcomes. The timelines are usually short to medium term. This definition is usually favoured by practitioners and international development agencies as development is based on set targets that must be achieved based on the agreed timelines. The second perspective of development is mainly focused on the outcomes of change based on short to medium term outlook. This perspective of development if is somewhat problematic as the set of goals or objectives identified by specific group of practitioners or international development agencies as the targeted goals may not be universally aligned (Sumner & Tribe, 2008).

Development' based on western modernity discourse

A third conceptualisation of development follows the 'post-modern' conceptualisation of development (Sumner & Tribe, 2008), where development is viewed as a social construct meaning that the objective sense of development doesn't exist. One can only understand socially constructed reality through

discourse, meaning there is no such thing as 'objective reality' (Sumner & Tribe, 2008). This perspective views development as a social construct that considers structural change.

Sen's definition of development

In a quest to understanding development, Sen (1993) conceptualised the capability approach that focused on evaluating social change through enrichment of human life. Contrary to the traditional dominant perspective that focused on economic indicators and decision-making to explain development, Sen's understanding of development takes the discourse of western modernity perspective that encompasses a broader view that also focuses on the social constructs that contributes to development (Thapa *et al*., 2012). In development evaluation analysis, this perspective considers individual and structural variations (Zheng & Walsham, 2008).

The focus given by Sen (1993) views development as a set of "activities and ways of being" which are valuable to an individual. According to Coelho, Segatto and Frega (2015), the assessment of development according to Sen's perspective takes the form of a reviewing functionings and the ability to use them. Coelho *et al*. (2015:4) defined functionings as "the things people value and can have, and a person's capabilities consists in alternative combinations of functionings whose realisation is feasible for him/her". According to Coelho et al. (2015:4), "the capacity of a person to choose amongst functionings is determined by conversion factors, that are factors by which people recognise a given set of resources, see if they have access to them and evaluate their interest and perceptions, reducing the initial set to one that is compatible to their capacity".

In Sen's (1999) perspective, the definition of development takes a complete turn to definitions already discussed. Sen's (1999) perspective focuses on development as a way of increasing an individual substantial freedoms that helps the individual to lead a life they value or has reason to value.

Sen (1999) argues that social well-being is not necessarily improved by the mere fact that resources are available, but by the people's choice how they use the available resources. This paper adopts Sen's understanding of development that define development as "a process that expands the real freedoms that people enjoy, value and have reason to value" (Sen, 1999:3). This definition takes the enabler perspective of ICT. According to Sein and Harindanath (2004) development is essentially related to the individual's enhancement of capabilities through empowerment and knowledge. These capabilities key to development are built through commodities (e.g. ICT) (Oxoby, 2009). Tshivhase, Turpin and Matthee (2016) view development the development of humans which is in line with Sen's conceptualisation of development as freedom. This study adopts Kleine's (2010) definition where development is conceptualised as the freedom of choice. The freedom enjoyed by individuals depends on other factors such as confines of structures and civil rights (Sen, 2000).

For Amartya Sen's (1999) understanding of development is applicable to this study as development is associated with freedom of choice. Acording to Zheng (2009), Sen's (1999) definition of development is appropriate to understand how ICT may foster development.

2.8 The impact of internet access on development

There has in the last few decades, been a terrific ICT progress that has since transformed several aspects of everyday life for human beings. Scholars in different fields of study have the pervasive economic effects that these ICTs have on different sectors of the economy (Castellacci & Tveito, 2018). It is now broadly agreed and accepted by many researchers that ICT contributes to different aspects of development beyond just economic aspects (Heeks & Kanashiro, 2009; Thapa, Sein & Sæbø, 2012; Zheng *et al*., 2018).

According to Castellacci and Tveito (2018), one of the key technological revolution in ICTs was enabled by the advancement of the Internet. The Internet has since become important to our everyday life. Individuals are now able to use the Internet to buy and sell goods and services online; search information and data, perform online banking and communicate with other people through tools like Skype, e-mail, and other social media platforms.

Despite claims presented of the role of internet technologies, there is still limited empirical research on the impacts that this technology has on an individuals' development. There is still a need to understand what impact the use of the Internet has on an individual's development. Development for the purpose of the study is defined as "a process that expands the real freedoms that people enjoy, value and have reason to value" (Sen, 1999:3).

This section reviews literature that is relevant in understanding the impact of internet usage towards development. These have in the last few decades transformed substantially several aspects of our everyday life, enabling a terrific progress for human beings both at the workplace and as individual consumers, agents and citizens. Innovation studies have extensively investigated the emergence and diffusion of ICTs, however, limited empirical research exists indicating how these innovations are impacting the development of communities.

Connectedness

It is said that internet access provides users with the ability to communicate with other people who are far from them, then enabling individual connectedness (Thapa *et al*., 2012; Galperin & Viecens, 2017). Thapa *et al*. (2012) studied the impact of wireless technology's contribution to development of residents in Nepal. The study found that the wireless project to provide broadband connectivity in a mountain region of Nepal enabled this remote villages the ability to communicate with other people who are far from this remote area through social media and other communication channels enabled by internet connectivity.

A study by Alias (2013) tried to understand how ICTs play a role in rural community development. This study showed how public internet access impacts social links among social resources. The study used Weigel and Walkdburger's framework for ICT4D and the choice of this framework to address Communication for Development (C4D), highlighting how ICT can be utilized for rural community development through connectedness.

Heeks and Kanashiro (2009) studied the impact of ICTs on remoteness and exclusion by analysing a telecentre in one district of mountainous Huancavelica, Peru. The study used the information chain framework to analyse exclusion. The study tried to understand the role ICTs can play in overcoming remoteness and exclusion as well as understanding what ICTs were used for in this district. The study found that positive resource flows for adolescent school students and young farmers was enabled. The study found that telecentres helped adolescents maintain social networks and supported information searches among young farmers, addressing remoteness and exclusion issues that the community was initially faced with.

Internet use is also considered to have an impact on loneliness (Nowland, Necka & Caciopp, 2017). In the study to understand how internet use impacts loneliness, Nowland *et al.* (2017) found that the Internet can be used forge new social connections and enhance existing relationships which then become a useful tool for reducing loneliness for people experiencing loneliness. The study found that the Internet offers a brave new world for lonely people who then utilise this medium as a pathway to reconnection with the social world. Creating a solution for those who struggle to connect with the social world in person.

Given the definition development by Sen (1999) where development is seen as the process that expands the real freedoms that people enjoy, value and have reason to value. The freedom of choice covered by the studies above was connectedness. People chose to use the Internet to be more connected as that is what they value and had a reason to value.

Education

One of the MDG laid out by the UN, is to make education available for all citizens in developing countries. The UN has adopted ICTs as a mechanism to enable education availability to everyone through internet computer technologies. The use of ICT in education revolutionaries the learning and teaching methods by providing new opportunities for learning and the way people can access educational resources. The use of ICT in education creates a new way of teaching and learning called E-learning that can be administered through internet technologies. In recent years, there has been a drastic increase in people are relying on the use of the Internet to conduct much human activity (Rayan, Dadoul, Jabareen, Sulieman, Alzayyat & Baker, 2017). Among many of those activities, people are now using the Internet educational purposes (Rayan *et al*., 2017). With the rapid growth of wireless technologies and broadband infrastructures, internet access is becoming essential of learning (Cui, Tso, Yao, & Jia, 2012). The modern society and information age has resulted in pressure to move away from the traditional way of learning and teaching to a more modern and multi-disciplinary approaches that utilises the ICTs like the Internet (Stošic & Stošic, 2015). For example, the many institutions of higher learning have embraced this modern approach and now offers global citizens the opportunity to reach their person goal with accredited qualifications accessible online.

Al-Gamal, Alzayyat & Ahmad (2015), stated that there are wide educational benefits of using the Internet which include doing academic research, retrieving online journals, browsing virtual libraries, learning languages and obtaining full academic degrees. Internet access enhances scholastic activities, which then has a positive effect in helping students achieve their educational goals (Tossell, Kortum, Shepard, Rahmati & Zhong, 2015). A paper by Cui *et al*. (2012) present a practical online laboratory platform, Web-based WiFi Laboratory (WeFiLab) to show the educational benefit of internet access. This enabled student to do experiments through their devices. A study by Hodge, Carson, Carson, Newman & Garrett (2017) showed that some people exercise their freedom of choice by using internet technologies to access range of educational services like access to courses offered by the universities of the third age and the local community library. Computers with the aid of internet technologies helps with ensuring that there is smooth progress of information sharing and the provision of educational opportunities to remote area communities.

"The Internet plays a pivotal role in extending access to educational resources and in accelerating knowledge sharing…Access to the Internet improves access to education by providing student with learning opportunities and materials online… As a result of education improvement, young people are more employable… Improved literacy promotes social inclusion and benefits the economy…"

Deloitte (2014)

While there are educational benefits of using the Internet, there is still differing opinions on the advantages and disadvantages of internet usage for academic purposes. Islam, Rahman and Hollebeek (2018) argue that when the Internet is used for entertainment, information seeking, social interaction and economic motives, there are notable effects. In some cases, internet usage can impact academic performance of students negatively. Galperin and Viecens (2017) argues that the impact of the Internet on educational outcomes is yet not clear as there currently exist no significant evidence proving the correlation between student's academic achievement and internet use. Although there is a burgeoning empirical literature on the economic and social impact of internet access (see Table 1), we have limited knowledge on how internet access affects education-related outcomes (Chen, Mittal & Sridhar, 2018).

Health and well-being

Internet connectivity has provided innovative way to access to different type of information through channels like search engines and social media. As the world become more digitally connected, there is a need to harness the capabilities provided by the Internet to these technologies; to improve access to health care as consumers' information seeking behaviours has changed. Questions commonly ask by researchers seek to discover "how does internet use affect human life, health and well-being?". According to Castellacci and Tveito (2018), the Internet has presented human beings with new formidable and diverse opportunities with wide array of important effects on individual well-being. In their study to investigate the role of the Internet in supporting well-being in later life, Lifshitz, Nimrod. and Bachner (2018) found that information seeking, interpersonal communication, use for leisure, task performance and recreation were some of the Internet functions used that then improve a person's well-being.

The Internet enables access to health information, allowing people to better manage their health needs, improving their well-being. Accessing health information through the Internet is increasingly becoming common given the large volumes of health information and data available for consumers to improve their individual health. The Internet offers people the opportunity to access various formats of health information like videos on YouTube, text, chat rooms, e-mail etc. For example, patient's health records and statement can simply be emailed to the clients without having to go collect them at the hospital. The Internet can also be used to enable health professional to support patients with health-related concerns.

Employment

According to Galperin and Viecens (2017), the adoption of internet technologies increases employment opportunities by providing an opportunity for the poor to acquire basic ICT skills needed in the job market. The Internet allows people to obtain critical up-to-date job information of high relevance to those looking for jobs, reducing the cost of the job searching process. A study by Noor (2018) found

that in Malaysia users used telecentres to find jobs which then resulted economically in benefiting people with higher income. Deloitte (2014:15) report shows that *"the Internet created new jobs through numerous avenues; directly through the demand for labour from new technology-based enterprises and indirectly through the demand from the wider ecosystem".* For example, YouTube content creators created their own employment by creating relevant on-demand content, resulting in advertisers paying for few seconds of advertisement on their video platforms.

Poverty

Studies have attempted to establish whether internet access and connectivity play a role in eradicating poverty (Galperin & Viecens, 2017). According to Deloitte (2014), the Internet provides a promise to help with eradication of poverty through development that allow people to participate in economic activities. Access to the digital world through the Internet had a positive impact on people's standard of living, as they start to develop new life capabilities like educating themselves while generating a sense of inclusion. In the Deloitte (2014) report, access to information through the Internet has increased job and business opportunities, leading to higher income while reducing extreme poverty globally. Alternatively, Galperin and Viecens (2017) argue that the relationship between internet use/access and poverty is very complex as the cause effect of their relationship is not so easy to identify, requesting for more studies to investigate this relationship.

The UN has adopted ICT4D to achieve its MDG (Alias, 2013). The above literature highlight how internet use is helping in addressing some of the UN MDG. The above examples are just few of the many outputs highlighting the developmental impact of internet connectivity.

2.9 Internet penetration in Africa vs the rest of the world

According to Senatore (2010), the Internet can be regarded as one of the fastest growing media mediums worldwide. With the advancement presented by the Internet, staying abreast with internet developments and other ICTs is not only crucial for a country's international competitiveness, it also provide social empowerment and social development. The findings presented by Internet World Stats (2017) shows that internet penetration in North America, Europe and Asia is growing rapidly while internet penetration in Africa remains relatively low and has not been able to keep up with this trend set by the rest of the world. According to Internet World Stats (2017), Africa's internet penetration is currently on 35.2% which means only 453 million people have access to the Internet out of the 1.3 billion, while the rest of the world has a penetration rate of 58.4%. According to United Nations Human Rights Council (2011), access to internet connectivity is considered a human right and depriving people from connecting to the Internet is against international law as it is a violatation of human rights. The UN Human Rights Council (2011:17) report emphasised that "*without Internet access, which facilitates*

economic development and the enjoyment of a range of human rights, marginalized groups and developing States remain trapped in a disadvantaged situation, thereby perpetuating inequality both within and between States". With the adoption of internet access as a human right by the UN, this means that 64.8% of the African population are deprived of their human right. United Nations Human Rights Council (2011), the Special Rapporteur shows that internet connectivity does not only to enable individual's freedom of choice, however, a range of other human rights are enabled to promote the progress of society as a whole.

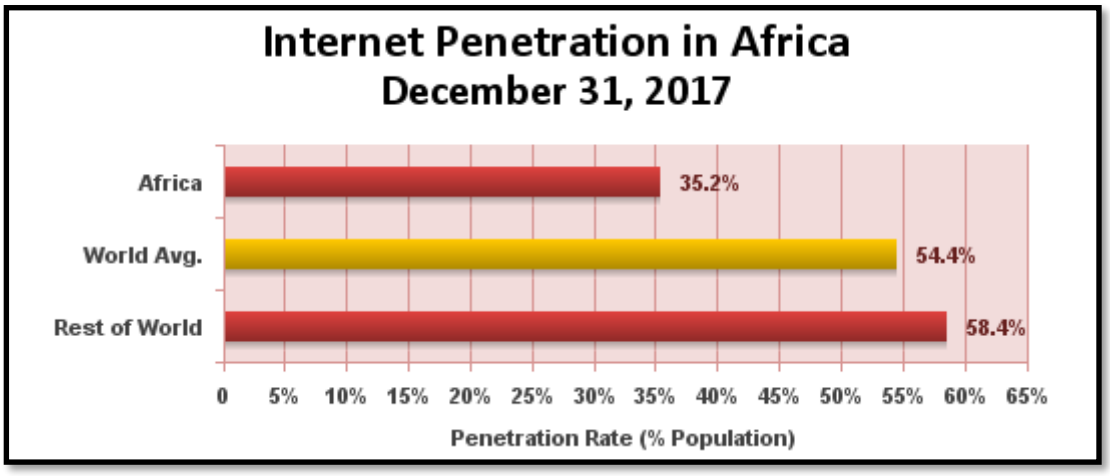

Figure 6: Internet penetration in Africa (31 December 2017)

Source: Internet World Stats (2017)

2.10 Internet penetration in South Africa

In South Africa and the rest of Africa there has seen a rapid growth in the number of internet users year on year. Despite the growth experienced in both country and continent, the rate experienced locally still falls behind as compared to the rest of the world's internet penetration, usage and diffusion. Although the statistics may vary per publisher, it is currently estimated by Internet World Stats (2017) and Statista (2017) that the top 5 countries in Africa in terms of number of internet users are Nigeria, Egypt, Kenya, South Africa and Tanzania with Nigeria being the leader of the pack with 98.39 million internet users.

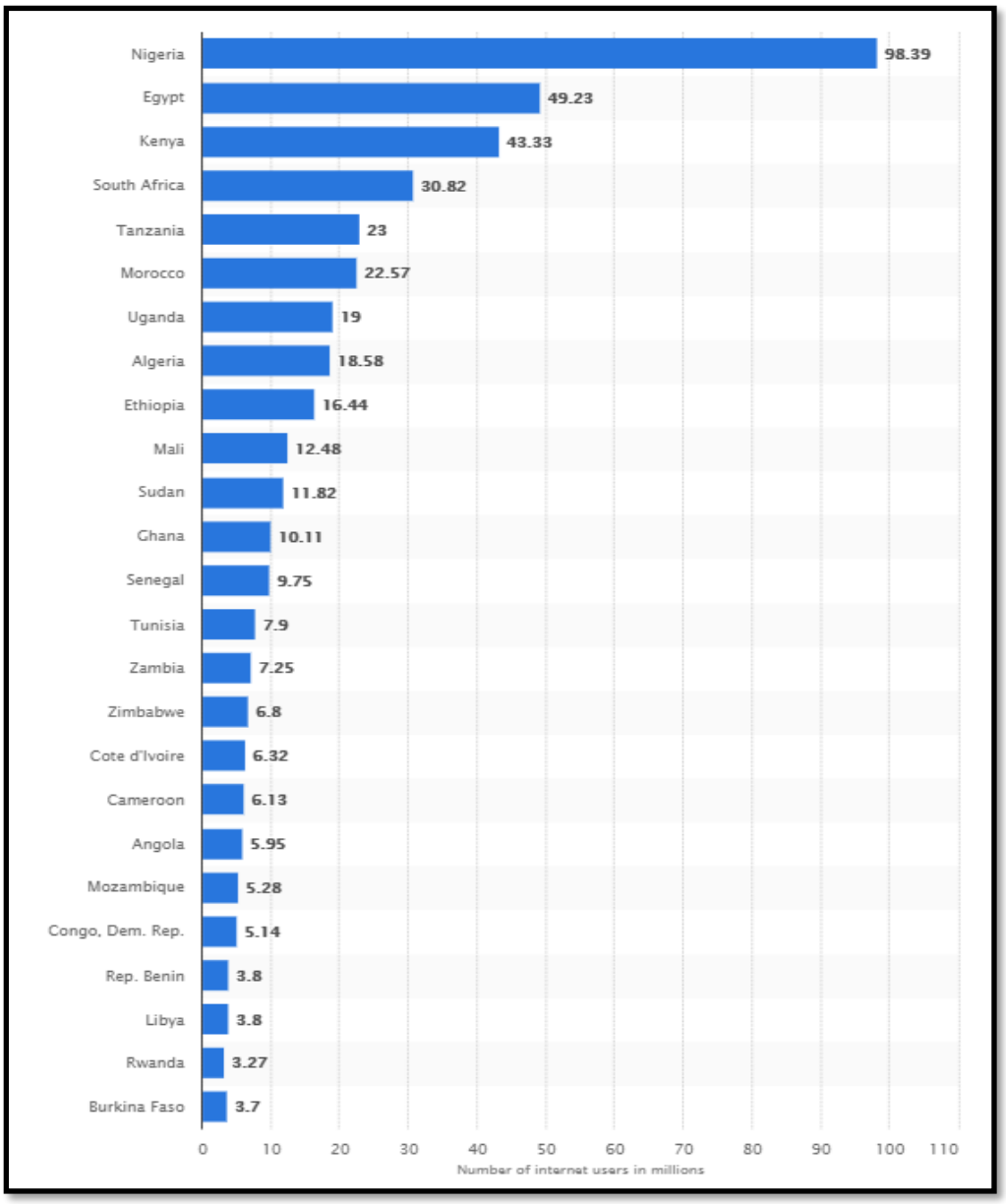

Figure 7:Internet penetration per African country

Source: Statista (2017)

Table 3: Africa's internet penetration

Africa	*Population*	*Internet Users (31 Dec 2000)*	*Internet Users (31 Dec 2017)*	*Penetration (% Population)*	*Internet Growth % 2000 - 2017*
Nigeria	195 875 237	200 000	98 391 456	50.20%	49,096 %
Egypt	99 375 741	450 000	49 231 493	49.50%	10,840 %
Kenya	50 950 879	200 000	43 329 434	85.00%	21,564 %
South Afric	57 398 421	2 400 000	30 815 634	53.70%	1,184 %
Tanzania	59 091 392	115 000	23 000 000	38.90%	19,900 %
Morocco	36 191 805	100 000	22 567 154	62.40%	22,467 %
Uganda	44 270 563	40 000	19 000 000	42.90%	47,400 %
Algeria	42 008 054	50 000	18 580 000	44.20%	37,060 %
Ethiopia	107 534 882	10 000	16 437 811	15.30%	164,278 %
Mali	19 107 706	18 800	12 480 176	65.30%	66,283 %

Source: Internet World Stats (2017)

According to Internet World Stats (2017), South Africa only had 2.5 million internet users in the year 2000. Although figures vary, currently it is estimated that South Africa has about 30.8 million internet users, showing a 1 184% internet penetration growth over 18 years (Internet World Stats, 2017; Statista, 2017). According to Statistics South Africa (2018) the South Africa population is estimated to be just over 57.7 million, South Africa currently has a 53.7% internet penetration rate. This still leaves almost half of South African population with no access to the Internet and well below international internet penetration standard.

When South Africa internet penetration rate is compared with the rest of Africa, Kenya leads with regards to internet penetrations rate. According to Internet World Stats (2017), Kenya's internet penetration is estimated to be 85% as compared to the South Africa's internet penetration rate that currently on 53.7%. In terms of internet penetration per population, South Africa has fallen behind Kenya, Mali, Morocco and Kenya. It was predicted by Buckland (2009) that Kenya's internet penetration would will also surpass South Africa. According to Statista (2017), the 71% of South Africa's internet users access the Internet using mobile devices, 25% through PC and 4% through tablets. The detailed breakdown per country is presented in the Figure 9 below.

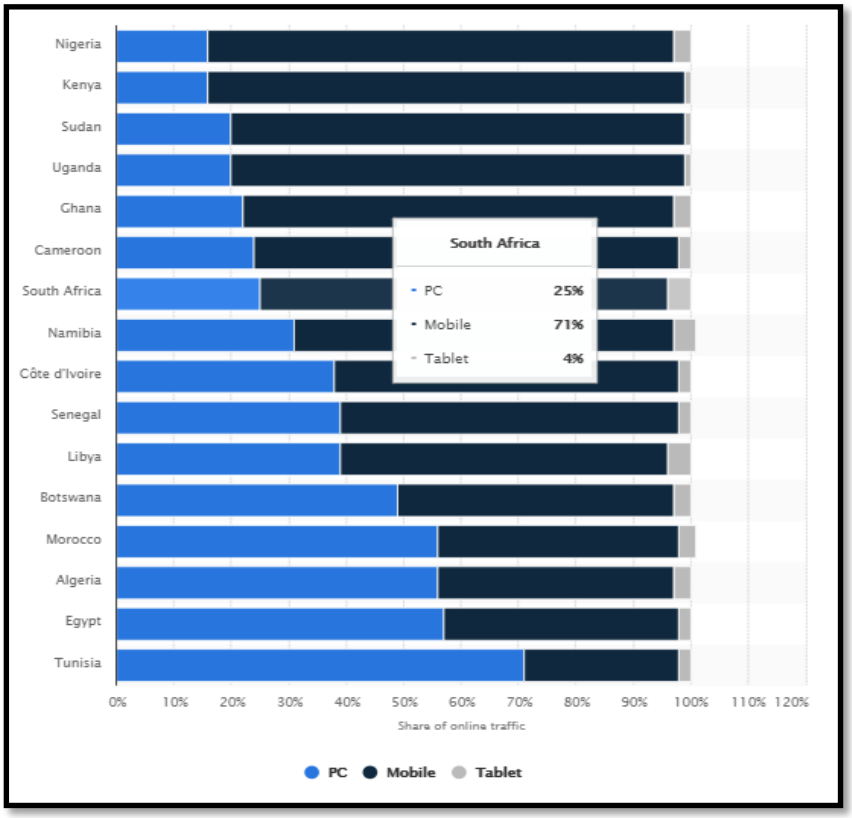

Figure 8: Africa's internet penetration per device

Source: Statista (2017)

When compared to the rest of the world, African doesn't have a fully established internet penetrations rate. Globally, funds allocated to projects with the goal of connecting four billion people remaining in the world without internet connectivity. These ambitious projects are positioned as instruments that can be used to help people and the government achieve a range of developmental goals. Given the developmental challenges in the African continent and relatively low internet penetration as compared to first world countries, there is a need for effective development strategies of how the internet can be used (Friederici, Ojanperä, & Graham, 2017). According to Deloitte (2014:3)

"The internet offers unprecedented opportunities for economic growth in developing countries. By providing access to information, connecting people to businesses everywhere, and opening up new markets, the Internet can transform the very nature of an economy and support economic development."

Based on the assumption presented by many practitioner reports that the increased access to internet connectivity enables economic growth, different development agencies, corporations, and city governments have launched ambitious internet connectivity projects and programmes to 'connect the unconnected', with the aim to improve economic growth and inclusive development (Galperin & Viecens, 2017). Within African countries there has been a drive to use internet connectivity to achieve similar ambitions presented by practitioner reports, this has also shaped policy development for many African countries. Below are some of the policies developed to achieve this ambition to 'connect the unconnected'.

"Internet and Broadband have been globally acknowledged as the foundation for transformation to a knowledge-based economy. It is also widely acknowledged that broadband infrastructure is an enabler for economic and social growth in the digital economy. Broadband has the potential of enabling entire new industries and introducing significant efficiencies into education delivery, health care provision, energy management, ensuring public safety, government/citizen interaction, and the overall organization and dissemination of knowledge… The Government will therefore pursue, by the end of 2017, a five-fold increase in broadband penetration over the 2012 penetration rate". Nigeria National ICT Policy (2012).

"All Rwandans shall have access to broadband connectivity as a basic utility and right. Citizens shall fully adopt and use the Internet in their daily life." Rwanda ICT Sector Strategic Plan 2018-2024 (2017:15)

"*The Internet is disruptive by its very nature and has and will continue to impact in more and more ways on every aspect of people's lives. It will transform the way societies and economies work,*

including how citizens interact with governments and each other, how governments deliver services and how businesses transact." Department of Telecommunications and Postal Services (2016:48)

"Make high-speed broadband internet universally available at competitive prices (p.24)….Change the regulatory framework to ensure that internet broadband capacity improves, prices fall significantly and access improves (p.57)." National Planning Commission (2013)

Given the 2030 inspiration by the South African government that is well documented in the National Development Plan (NDP) 2030. There has been a number of projects aimed at achieving this aspiration. For instance, the South African government launched Project Isizwe with the goal to ensure that South Africans are connected to the Internet by making free public WiFi hotspots available in public centres. This project aims to ultimately address the country's low internet penetration while addressing various inequalities (Project Isizwe, 2015). Project Sizwe has rolled out over 780 Free public WiFi hotspots in Tshwane, 1.6 million unique devices connected/unique users since November 2013. The project has also launched Free WiFi in the Western Cape, over 40 000 users around schools in Atlantis and Robertson. The introduction of free public WiFi in South Africa was aimed at addressing some of the development challenges experience by South African residents. The next section discusses the South African development challenges.

The next section discusses the various South Africa social and economic factors that may directly or indirectly impact the SA's internet penetration.

2.11 South African socio-economics challenges

There is no nation on earth without challenges, South Africa just like many developing countries is faced with many socio-economic challenges. Ipsos (2018) reflected in their study that the world's current top worries are poverty and inequality, unemployment and crime and violence, health care and corruption. South Africa is battling with challenges like inequality, poverty, unemployment and hunger despite having achieved democracy for more than two decades (Van der Westhuizen & Swart, 2015). Most of these socio-economic issues are a legacy of apartheid. African National Congress (ANC) won the first democratic elections held in April 1994 with a majority vote to head a new democratic government. The ANC started to implement various programs to redress the legacy of apartheid and rebuild a new South Africa. The Reconstruction and Development Programme (RDP) was the ANC's 1994 election manifesto. In the 1994 ANC's election manifesto, the ANC promised 'a better life for all'. To achieve 'a better life for all' as promised in the election manifesto, the 1994 ANC government adopted the Reconstruction and Development Programme (RDP) shortly after the ANC won the 1994 elections. In order to redress the legacy of the apartheid government, the ANC government chose RDP as the main socio-economic development

Reconstruction and Development Programme (RDP)

The Reconstruction and Development Programme (RDP) initially formed part of the ANCs 1994 election manifesto. The Aim of Reconstruction and Development Programme (RDP) was divided into four pillars namely (ANC, 1994: 15, 16):

“

- Creating opportunities for all South Africans to develop to their full potential;
- Boosting production and household income through job creation, productivity and efficiency, improving conditions of employment, and creating opportunities for all to sustain themselves through productive activity;
- Improving living conditions through better access to basic physical and social services, health care, and education and training for urban and rural communities, and
- Establishing a social security system and other safety nets to protect the poor, the disabled, the elderly and other vulnerable groups.”

A main objective of the RDP was to address basic needs are such as “jobs, land, housing, water, electricity, telecommunications, transport, a clean and health environment, nutrition, health care, and social welfare”. The RDP was disbanded in 1996, while the programme may have been disbanded in 1996, the goals of the RDP live on in post-RDP programs. After the RDP was disbanded, Growth, Employment and Redistribution (GEAR) strategy was introduced.

Growth, Employment and Redistribution (GEAR)

The Growth, Employment and Redistribution (GEAR) strategy was introduced in 1996 under the leadership of honourable minister Trevor Manuel after the RDP was disbanded. The GEAR was a strategy that was aimed at rebuilding and restructuring the economy while acknowledging the milestones of the Reconstruction and Development Programme. The GEAR aimed at addressing various socio-economic issues. The vision of gear was:

“As South Africa moves toward the next century, we seek (Department of Finance 1996:1):

- a competitive fast-growing economy which creates sufficient jobs for all work seekers.
- a redistribution of income and opportunities in favour of the poor.
- a society in which sound health, education and other services are available to all.
- an environment in which homes are secure and places of work are productive.”

Various Socio-Economic Development (SED) programmes have been implemented in South Africa and in 2013 the Minister in The Presidency: National Planning Commission, honourable minister Trevor Manuel launched the National Development Plan (NDP) 2030.

National Development Plan (NDP) 2030

The NDP 2030 was launched in 2013 as a strategy that offers South Africa's long-term perspective to reach that goal various goals outlined in the plan. According to the NDP 2030 (2013:24) The National Development Plan aims "to eliminate poverty and reduce inequality by 2030. South Africa can realise these goals by drawing on the energies of its people, growing an inclusive economy, building capabilities, enhancing the capacity of the state, and promoting leadership and partnerships throughout society."

Despite the various Socio-Economic Development (SED) programmes, the socio-economic development challenges in South Africa are still overwhelming. Below are some of the SED issues that South Africa is still faced with:

High unemployment

South Africa is among the countries with the highest unemployment rates in the world. High unemployment and low incomes are at the heart of many of the South African socio-economic development challenges. High unemployment and poverty still remain constant challenges in South Africa. According to Ipsos (2018) unemployment is among the top concerns of South Africans, with crime being top of their worries. South Africa's official unemployment rate has been on a constant increase over the past ten years. Over the period 2008 to 2018, the South African unemployment rate was 21,5% in 2008 and has since increased to 27.5% in 2018 Q3. Statistics South Africa (2018) defined unemployment as people who were not employed but had taken steps to look for a job or to start a business and were available to take up a job had it been offered. According to the Quarterly Labour Force Survey conducted by Statistics South Africa (2018), as at the end of Q3: 2018 there were 6,2 million working age population (15–64 years) South Africans unemployed. Of the 6.2 million, 68.8% (4,3 million) have been unemployed for a year or longer (Statistics South Africa, 2018). According to Statistics South Africa (2018), the number of people who have been unemployment for over a year has increased by 1,7 million, from 2,6 million in 2008 to 4.3 million in 2018. An unemployment rate higher than 25% of the total population is considered very high (Ngonyama, 2016). This means that South African is currently experiencing a very high unemployment rate as compared to other countries.

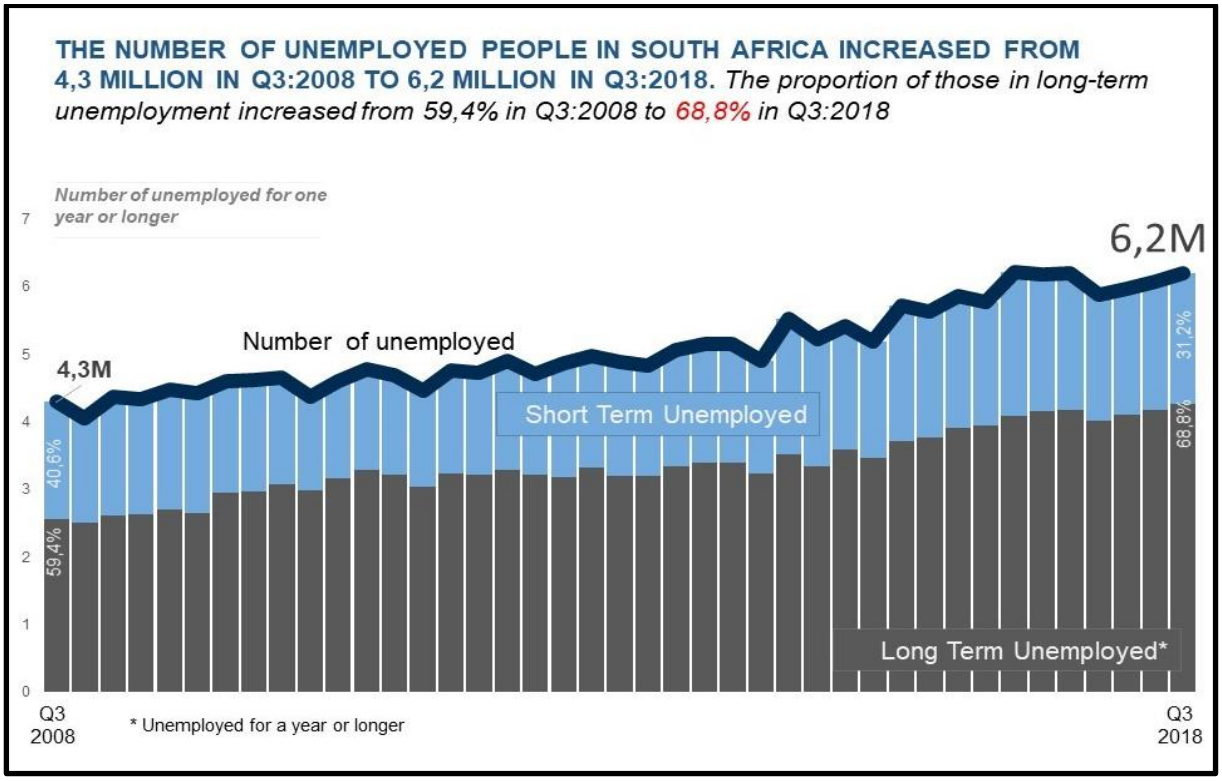

Figure 9: South African unemployment rate

Source: Statistics South Africa (2018)

According to Van der Westhuizen and Swart (2015), there are various factors that are contributing to the high unemployment rate in South Africa. Van der Westhuizen and Swart (2015) notes that structural unemployment and frictional unemployment are the most common form of unemployment in South Africa. According to Hindson (1978:8), structural unemployment "persists even when productive capacity is fully utilized, and may be defined as the difference between the trend level of employment and the economically active labour force at any point in time". This form of unemployment refers to the mismatch between demand and supply in the workforce (Van der Westhuizen and Swart, 2015). The South African unemployment is believed to be "structural", with the labour market is often said to be not supplying proper skills that are required by employers; resulting in many people being structurally unemployed Vermeulen (2017). Another source of this form of unemployment is believed to be the "over-supply of unskilled labour and a larger group of women entering the labour market" (Levinsohn, 2007:2). As a result of the majority of unemployment being structural, it is therefore less responsive to changes in aggregate demand. Economic growth is thus the only remedy in employment creation (Vermeulen, 2017). According to Development Policy Research Unit (DPRU) (2017), the legacy of South Africa's apartheid history has contributed to the nature of unemployment in South Africa where the economic growth of the country is dependent on dearth of skills.

While all economically active age groups are currently affected by high unemployment levels, the youth are the most affected age group. According to Statistics South Africa (2018), Youth (young people aged 15–34) unemployment rate in South Africa is currently on 39.0% as compared to adults unemployment rate that is currently on 17.9%. This youth unemployment rate indicates that more than one in every three young people in the labour force was unemployed in the third quarter of 2018 (Kubheka, 2018).

While all economically active age groups are affected by unemployment, the severity of the unemployment rates also differ vastly across the South Africa racial groups. The honourable president Cyril Ramaphosa also acknowledges that there a big difference between black and other ethnic groups' unemployment rate. In his 2018 State of the Nation Address honourable president Cyril Ramaphosa can be quoted saying the "*unemployment among Africans stands at 30% and just under 7% for white people…Big difference. So one can never say the other are much more advantaged than the others. Employment prospects still favours white young people as compared to their black compatriots and that is dealing with the reality, the reality that is born out of evidence*" (Parliament of the Republic of South Africa, 2018, 00:21:15). The official statistics release in the third quarter of 2018 by Statistics South Africa (2018) shows that 31.1% of Black or Africans are unemployed while Coloureds are on 21.8% , Indian/Asian on 10.1% and Whites on 7.1%.

Poverty and inequality

Two decades post-apartheid, the legacy of the system still left inequalities that are still across racial groups. According to The World Bank (2018) South Africa is still faced with the triple challenge of high inequality, high poverty and high unemployment. More than half (55%) of the South African population are chronically poor living on a poverty line of R992 per person per month (The World Bank, 2018). The World Bank (2018) report shows that "poverty levels are consistently highest among female headed households, black South Africans, and children below the age of 15 and these groups tend to have a higher risk of falling into poverty". The World Bank (2018) also shows that the severity of poverty differs per spatial dimension in South Africa. The Eastern Cape (59.1%), Limpopo (57.0%) and KwaZulu Natal (26.0%) province were the top three provinces where poverty was apparent for the period between 2006 and 2015. Gauteng province had the lowest poverty rate at 19.0% percent in 2015. The World Bank (2018) shows that the legacy of apartheid is still apparent that poverty still largely concentrated in previously disadvantaged areas that were specifically for black South Africans during apartheid, the former homelands.

The South African consumption per capita Gini coefficient was 0.63 in 2015, making South Africa is one of the most unequal country in the world (The World Bank, 2018). The country is faced with vast inequalities in health, education and basic infrastructure, such as access to electricity, water, sanitation, and housing.

To address these challenges, the South Africa's development has since introduced various SED policies, from RDP, GEAR to the current National Development Plan: Vision 2030 (NDP).

2.12 Internet penetration vs South African socio-economic challenges

"The problem of low Internet penetration is complex, multifaceted, and hinders social, economic and political developments. This problem resides within seemingly entrenched societal inequalities, and is exacerbated by factors of economics, inappropriate policy framework, infrastructural problems and many social ills of illiteracy as well as absence of social and cultural capital toward technology"
Oyedemi (2012: 303).

A study by Okorodudu and Okorodudu (2016) that examined the relationship between fibre optics communication and internet penetration in Nigeria found that a large number of people live in extreme poverty below the poverty line which makes the cost of access to the Internet and purchase of mobile devices challenging. This shows that the persistence of socio-economic challenges like high inequality, high poverty and high unemployment directly impacts internet penetration. Oyedemi (2012) supports this by noting that the occurrence of social inequalities further exacerbates the pattern of digital inequalities due to limited access and resources.

RAMP index (2018) conducted a study where South Africa's cheapest 1gb of data was compared to other African countries using US dollars. The study found that South Africa performs poorly in the RAMP index, coming 35th of out of 49 African countries. The cost of the cheapest 1 GB of data in South Africa is USD 8.28 (R99) seven times higher the cost of 1 GB in Egypt (USD 1.13) and nearly three times the cost of same data in Ghana, Kenya and Nigeria (see Figure 11). According to Chinn and Fairlie (2004), access charges are negatively associated with internet penetration, while the ration of people in urban areas, income per capita, literacy, and a large service sector share are all positively associated. According to Mothobi (2018), affordability is the key component in enabling universal access and usage. Affordability depends primarily on the price and the user's disposable income. In the inquiry, Mothobi (2018) found that it is evident that the price of communications in South Africa is unaffordable to the poor. Mothobi (2018)'s inquiry also found that high rand-dollar exchange rate, increasing costs of key inputs, in the absence of high-demand spectrum being released to operators for 4G and regulatory issues were the cost drivers of unaffordable price of communications in South Africa.

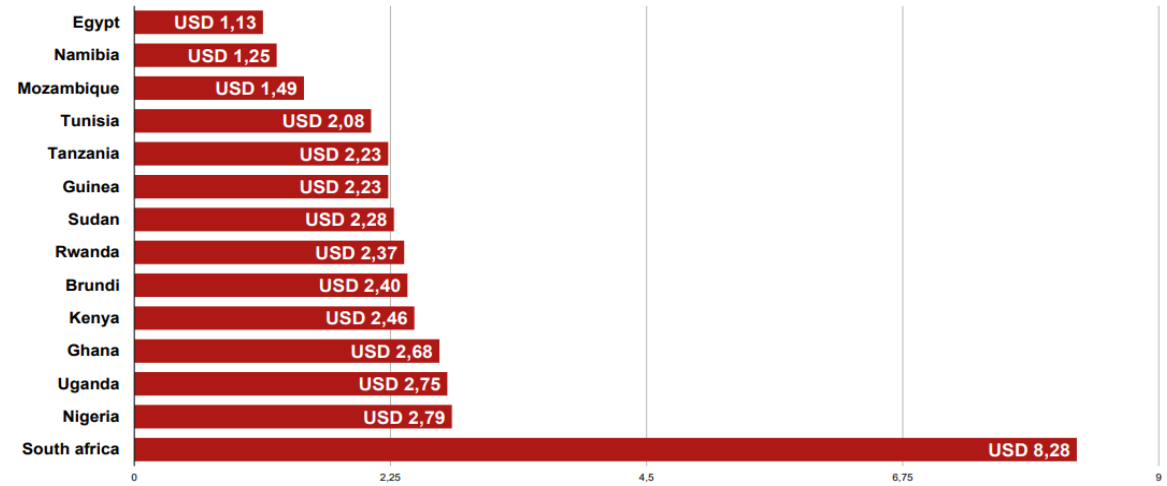

Figure 10: South Africa's data prices as compared to other African countries.

Source: RAMP Index (2018)

Section 2.12 discussed how internet access and use directly impacts in the on individuals' development. The literature showed that internet access enables individual connectedness (Thapa *et al*., 2012; Galperin & Viecens, 2017), becomes essential for learning (Cui *et al*., 2012), presents a wide array of important effects on individual well-being (Castellacci & Tveito, 2018) and can positively impact unemployment and poverty reduction (Galperin & Viecens, 2017). Whilst ICT4D literature is available, few studies exist that considers the South African context. The next section examines existing literature with reference to the South African context.

2.13 ICT4D research in a South African context

Whilst ICT4D literature is available, few studies exist that considers the South African context, while some have several epistemological shortcomings (Raiti, 2007). This concern raises a need for rigorous ICT4D research that assesses the impact of ICT4D initiatives (Rislana *et al*., 2015). Whilst what we know about the impact of internet use on development has been presented in the previous section, the majority of the literature discussed the possible impact of internet use with little focus on the actual impact or case studies. The literature also shows that there exists little literature in ICT4D that covers the impact of internet use in the context of South Africa. This then call for researchers to study the covers impact of internet use in the context of South Africa. Various developing countries are harnessing ICTs to become an advanced inclusive 'information society', the section below present ICT4D studies that have been conducted in the context of South Africa.

Domestication of free WiFi in South Africa

Chigona *et al*. (2016) contributed to the ICT4D literature in the South African context by trying to understand the domestication of free WiFi in the Western Cape, South Africa. The study tried to understand experiences of people using the free WiFi. The study asked the following questions: "How do people living in underserviced communities in the Western Cape Province of South Africa engage with the free WiFi that they have access to?" and "what factors inform the use of the free WiFi?". While these questions are relevant to ICT4D, the study tried to understand the use or non-use of WiFi and intentions to use these WiFi services. The study tried to explain the use and the type of use with no focus on understanding the development outcome of these WiFi. This study is more aligned with the study by Bass, Nicholson & Subrahmanian (2013) that tries to understand the social drivers that may either enable or inhibit individuals from taking full advantage of ICT resources for the furtherance of their own lives. The study argued that understanding the social drivers that may either enable individuals or inhibit them from taking full advantage of ICT resources for the furtherance of their own lives. These studies did not fully capture the development outcomes or the impact but rather focused on explaining the use.

Evaluating the success of public access ICT (telecentres)

Another study by Pather and Gomez (2010) investigated that success of telecentres in South Africa and Brazil. The study focused on the issues of access, capacity and environment. The study focused mainly on the level of success or failures of the public access initiatives in South Africa and Brazil. The main focus of this study was to understand the success of the ICT4D projects and not the impact that ICTs have on development. Another study by Bisimwa, Brown and Johnston (2018) empirically investigated the use of mobile phones by urban refugees in South Africa to understand whether mobile phones help to generate or fail to generate capabilities for empowerment by critically investigating factors that enable or hinder development of capabilities by refugees using mobile phone use. This qualitative study is theoretically based on the integration of Sen's Capability Approach (CA) and Bourdieu's Theory of Practice (TOP) to explain empowerment through the use of mobile phones. While this study tried to understand the impact of ICT4D, the study focused on mobile phones and the unit of study was refugees. The context of assessing WiFi's impact on development in south Africa has not be covered in great length.

The impact of ICTs on individual Quality of Life (QoL)

A study by Attwood, Diga, Braathen, and May (2013) investigated the impact that telecentres have on the impact of QoL in disadvantaged communities. The study investigated four telecentres in KwaZulu-Natal (KZN) provinces, South Africa. The study found that telecentres positively impacts individual QoL through empowering.

Osman and Tanner (2017) contributed to ICT4D research in South Africa by studying how telecentres influence Psychological Empowerment (PE) of people. The study found that various components of telecentres influence the psychological empowerment of "underserved" community members. While this study is focused on ICT4D, the focus was on telecentres and its impact on psychological empowerment which is only one aspect of social impact that ICTs have and doesn't provide a holistic lens on the impact on development.

Despite the studies and empirical evidence presented by different studies, the process through which the impact of ICT on development occurs remains unclear (Thapa, Sein & Sæbø, 2012). There is therefore a need to understand the impact that ICT4D has on development and the type of impact experience by end users, in this case, the impact of free WiFi hotspots.

Impact of free WiFi on consumers' purchase intentions

A study by Kovar (2016) investigated the impact that free WiFi on townships consumers' purchase intentions and their likelihood to return. According to Kovar (2016), the standard of internet infrastructure in townships is inferior as compared to the once in suburbs. The study found that the material and skills a user possess positively influences the intention to use WiFi. The study also found that purchase intention and return purchase likelihood was influenced by the intention to use the WiFi. This study is important because it shows the potential that WiFi has to drive commercial activity and hence economic.

Whilst the ICT4D field is well established globally, it is still gaining momentum in South Africa. Various South African city governments continue to embark on broadband infrastructure investments in an attempt to provide internet connectivity to their residents (Mutula & Mostert, 2010), however, there exist few research studies that assess the impact that these investments have on development of residents.

2.14 Public WiFi hotspots

The dependence on ICTs has increased over the past decade, this has resulted in the increased demand for the Internet (Aswani, Ilavarasan, Kar & Vijayan, 2018). The Internet holds a great promise to this empowerment by connecting people and addressing people's information needs. The need to always be connected has resulted in the increase in the usage of wireless internet services.

Today, wireless technologies are very common (Ullah, 2012). According to Ullah (2012), there are various wireless technologies each comprising of uniques properties and markets, these wireless technologies include Long Term Evolution (LTE), 3G, 4G, 5G and WiFi. WiFi technology allows various internet-enabled devices to communicate over a wireless signal (Ullah, 2012). According to Ullah (2012), "a typical WiFi network includes three parts: a wired connection to a broadband provider, an access point, and a computer connected by wired and wireless connections".

The increased demand for internet access and the prevalence of portable computing devices such as smartphones, laptops and tablets has resulted in WiFi hotspots being widely and openly deployed in many private and public places such as airports, citizen service centres, shopping malls, cafes and public squares (Ullah, 2012; Cheng, Wand, Cheng, Mahapatra & Seneviratne, 2013). WiFi hotspot is basically the location or an area where WiFi access to the Internet is available to user. Geerdts *et al*. (2016:7) define WiFi hotspot as "a service point from which WiFi is offered, usually public WiFi. Since the term can refer to a single access point, or a WiFi zone (consisting of multiple WiFi access points (Aps)) the term is used with caution in this report.". WiFi hotspot is sometime referred to as WiFi zone. WiFi zone just like WiFi hotspots is basically an area covered by public WiFi. WiFi hotspots are becoming very common in areas such as parks, coffee shops, airports, hotels. Recently WiFi hotspot are becoming available in public transport, such as taxis, buses and trains and other less obvious locations. According to Ullah (2012), purpose of these Wifi hotspots is to enable internet access will limited requirement for wires. Wifi hotspots that are available for the public are known as public WiFi hotspots (Cheng *et al*., 2013).

Given the different benefits associated with WiFi hotspot technology, different city and municipal government are adopting wireless technologies as a way to enhance internet access to society at large and addressing developmental challenges such as digital divide (Bakera, Hansonb & Myhill, 2009). Various city and municipal government globally are now offering WiFi for free or at a low service cost promised in the public interest of citizens. Acording to Bakera *et al*. (2009) and Jassem (2010) WiFi hotspots or zones that are provided by city or municipal government can be referred to as municipal WiFi. According to Bakera *et al*. (2009), municipal WiFi have been positioned as a solution to providing accessible internet to residents to ensure that residents experience the associated benefits of WiFi hotspot technology. Municipal WiFi had its genesis around 2005 in the United States (Jassem 2010). During that time, municipal WiFi were positioned as a mechanism that will transform towns and cities into modern metropolitans (Jassem, 2010).

For the purpose of this study, WiFi hotspots or zones that are provided by city or municipal government are referred to as free public WiFi hotspots. Various national and city governments globally have started different initiative to offer residents with free internet access as a way to increase resident's presence in

the cyberspace, among those being South Africa. In the next section, different initiatives that have been taken by different South Africa national, provincial and local governments to provide residents with free WiFi are discussed.

2.15 Free public WiFi hotspots initiatives in South Africa

There has been an increase in availability of WiFis for internet access in public spaces (Hampton & Gupta, 2008). According to Ipass (2015), top three countries with the most number of public WiFis deployed were France, United States and United Kingdom. France currently heads the leader board due to its early investment in WiFi networks with more than 13 million hotspots, 9.8 million in the United States and 5.6 million in the then the United Kingdom. According to Ipass (2015), about 32 million total hotspots were expected to be deployed in the United States by the end of 2015 and leapfrog France. Ipass (2015) estimates that more than 340 million were expected to be deployed by 2018, that means that for every 20 people, there will be one WiFi hotspot available for them to use.

According to Geerdts *et al*. (2016), the over-promise and under-delivery of public WiFi in the last decade in the northern hemisphere meant that public WiFi, privately or publicly funded, has been slow to gain traction in Africa. However, this was not the only reason public WiFi has been slow to gain traction in Africa. Africa's different conditions such as regulations, large numbers of people who currently do not have or have very limited access to internet connectivity, the high price of data and relatively high prices for the internet-enabled devices as compared to other parts of the world and competing demands for limited public funds has resulted in the slow traction. Despite the challenges that African countries are faced with, Africa urgently needs innovative solutions to address these development challenges.

Several South African city governments have since embarked on broadband infrastructure investments in an attempt to provide internet connectivity to the residents (Mutula & Mostert, 2010). According to Geerdts *et al*. (2016), Knysna municipality commenced the project of getting communities connected around 2006, the Knysna municipality started the first free public WiFi initiative. This initiative was called project "UniFi" Knysna. The second municipality to implement free public WiFi was Stellenbosch municipality, this initiative provided free public WiFi to the town centre. These projects failed to gain enough tractions; with the Stellenbosch project receiving wide criticism for being ad hoc, overly hasty and poorly conceived (Geerdts *et al*., 2016). South Africa's main metropolitan cities like Tshwane, Cape Town and Johannesburg have since taken the concept forward.

There are currently several areas where free internet connectivity in the form of free public WiFi hotspots is provided to the residents in Tshwane, Johannesburg and Cape Town. There are various

models of public WiFi in South Africa, but in early 2016 only two provinces (Gauteng and Western Cape) had implemented accessible free WiFi initiatives. As a way of using ICT for Development (ICT4D), the South African government in metropolitans like the City of Cape Town, City of Tshwane and City of Johannesburg have initiated and implemented the free WiFi hot spots to improve the quality of live for resident in these cities (Chigona *et al.*, 2016). These initiatives are discussed below.

City of Tshwane

The City of Tshwane (CoT) has partnered with Project Isizwe and its commercial implementing partner, Herotel Telecoms to roll out free WiFi throughout the city and surrounding communities. According to Alfreds (2013), this initiative aimed to benefit the local community with access to information, employment opportunities and education. Phase one of rolling out free public WiFi in Tshwane commenced November 2013 (Geerdts *et al*., 2016). The scope for phase one was "to connect three educational institutions, a section of a community centre in Mamelodi and two open areas in the CBD town centre" (Geerdts *et al*., 2016). According to Project Isizwe (2014) Phase one was rolled out in the Tshwane University of Technology, University of Pretoria, Tshwane North College, Church Square in the Pretoria city centre, Mamelodi Community Centre and Tshwane City Hall. Phase one offered users 250MB per user per day 1Mbps download speeds and 256kbps upload (Project Isizwe, 2014).

The CoT launched phase two in July 2014 with a budget of fifty-three million rands to roll out 213 hotspots township schools found in Atteridgeville, Mamelodi and Soshanguve (Geerdts *et al*., 2016). According to the City of Tshwane website, the city has since rolled out over 780 free public WiFi hotspots where users can now enjoy 500MB per day as compared to the 250MB per day that was offered in phase one. The CoT website reports that the initiative has had over 1.6 million unique devices connected to the hotspot since the initial implementation in 2013.

City of Ekurhuleni

The City of Ekurhuleni (CoE) commenced its WiFi project in January 2015 and was successfully launched in November 2015 with an aim to be completed in January 2018. According to Geerdts *et al*. (2016), the project has a budget of R120M to provide WiFi access to 695 building which includes libraries, clinics and other public buildings to promote connectivity within Ekurhuleni. CoE has partnered with Altech Alcom Matoma, together with black-owned service provider MMIV to roll out free WiFi throughout the city and surrounding communities. Unlike the CoT project that currently offers 500MB per day, the CoE offers users access to the Internet with a daily cap of 250MB.

City of Cape Town

The City of Cape Town (CoCT) commenced its free public WiFi project in 2013 with the goal of making broadband internet connectivity more accessible to households in under-served communities in the WC to access the cyberspace (Geerdts *et al*., 2016). According to the CoCT website, the CoCT has over 100 hotspots installed in public buildings across Cape Town. The CoCT offer user 50MB per day. This is quite low as compared to the CoT, CoJ and CoE.

City of Johannesburg (CoJ)

The CoJ has since rolled out over one thousand WiFi hotspots throughout the City of Johannesburg, of which the CoJ hired approximately 3000 Johannesburg digital ambassadors (JDAs) to help this initiative by training residents on how to utilize and benefit from the broadband connections in their area pile. According to Jozi JDA website, The CoJ has made free WiFi available in public places like clinics, swimming pools, Rea Vaya bus stations and other popular public spaces. The JDA is the contracted organisation that helps residents connect to the free WiFi. JDA, found at www.digitalambassadors.org.za , explains that residents can connect to this free data via CoJsmartWiFi and Joburg FreeWiFi.

According the City of Johannesburg's website, the CoJ WiFi hotspots rolled out throughout Johannesburg provide residents with a cap of 300 megabytes (MB) of free data to use per day, this amount to 9 GB of free data per month. According to Jozi Digital Ambassador (2016) more than 400 000 residents have since been provided training and awareness on the City's free WiFi. The CoJ understands that access Free WiFi the development of residents.

Despite the benefits that have been associated with internet access, the South African internet penetration remains relatively low as compared to the rest of the world. This has resulted on limited studies trying to understand how the access to free public WiFi hotspots actually impact people's development. This study aims to address this research gap while focusing on CoJ residents.

2.16 Chapter conclusion

This chapter provided an in-depth literature review on the phenomena under study. This chapter also examined existing literature on the impact of ICTs on development and later focused on the impact of free public WiFi hotspots on development. The chapter proceeded to examine various ICT4D initiatives implemented in South Africa specifically focusing on free public WiFi hotspots and the maturity of ICT4D research in South Africa. The next chapter introduces the theoretical framework selected to underpin study as well as the justification of why the selected framework is appropriate for the study.

Chapter 3: Theoretical Framework

3.1 Introduction to Chapter 3

This chapter introduces the theoretical framing for the study and presents a discussion on why a theoretical framework was adopted to be relevant for the study. The chapter also examined popular academic theories used to study ICT4D and the theories used to underpin the study. The chapter explains the selected theoretical framework and justifies why the framework in question was selected. Background literature is presented to explains the characteristics of the theory deemed appropriate for the purposes of the study. For the purposes of the study, the Choice Framework is selected as the theory that meets these requirements for the study.

3.2 Theoretical framing

Theoretical framework provides a base position which then allows the researcher to engage with the research in a particular field of study (Agherdien, 2007). In ICT4D research field, there is a need for theory-based evidence on the impact of ICT on development (Heeks, 2006). According to Karanasios (2014) theoretical framing and theoretical contribution to ICT4D body of knowledge remains weak especially when it comes to showing how ICT and information have led to transformation (or not) of human activity in a development context.

3.3 Popular models and theories in the ICT4D field

This section discusses popular theories that have been applied when studying ICT4D and theory that this study will use to help understand the phenomena under study and operationalise ICT4D. As discussed in the literature review section, existing literature has applied existing models and theories to the ICT4D field. These studies identified various finding on how ICT actually impacts on development. However, some of these studies borrowed theoretical constructs from existing theories and models, of which some are focused on business, adoption and success of ICT and overlooked studying holistic impact of ICTs on development. Models and theories such as Actor-Network Theory (ANT), Activity Theory and Sen's CA have been used to study ICT4D, however these theories/models do not address holistically on how ICTs impact on socio-economic development. The characteristics of some of the models and theories that have been used in the ICT4D field are also discussed.

Actor-Network Theory (ANT)

Process of sociology are used to build Actor-Network Theory (ANT), focuses on how actors build and maintain networks (Law, 1999). According to Walsham (2017), ANT helps the researcher investigate the motivation and actions of actors. In the field of Information Systems (IS), ANT is well established as it helps to analyse socio-technical phenomena (Sein *et al*., 2016). ANT helps researcher to understand the relationship that exists among actors and the process on how these relationships are developed (Walsham, 1997). In this theory actors consist of human and object (Walsham, 1997; Law, 1999). In ANT, both human and objects components play important role in development or implementation stages of information systems and are given equal emphasis. Actors in the network are responsible for working together to ensure that they reach the goal which is to successfully implement a working information system.

According to Andrade and Urquhart (2010), ANT enables the researcher to development of a detailed analysis to understand the success and failures of an ICT project. It is believed that by tracing the interaction between humans and objects or IT artefacts, the researcher will then be able to understand the negotiation process that takes place during the implementation of an ICT project. ANT has been used in ICT4D research as it give perspective and helps researchers to afford/gain visibility into and to discover why a supposedly hopeful ICT4D project is successfully deployed or not, as well as the translation of the events that exists among the actors (Andrade & Urquhart, 2010). Walsham (2017) highlighted that ANT is not with fault, but it has its own limitations**.** Walsham (2017) found that ANT pays little attention to social structure that influence the local and disregard consequences of technical choice (moral and political consequences). Social structures are important to ICT4D research as context and the social structures can influence the success and failure of ICT4D initiatives.

While the ANT offers and understanding of actors as both humans and non-humans, it however ignores mediation of cultural resources. According to Miettinen (1999:182), "*ANT does acknowledge the general notion of activity and networks, however it does so in general way that ignores mediating cultural resources and phenomena as learning, development of expertise, complementarity of resources, and know-how*". However, for the purposes of this study, the theory is not enough to understand the impact of free public WiFi hotspots as ANT focuses on understanding the relationships as well as the motivation and actions among the network.

Activity Theory

L. S. Vygotsky laid the original foundation of the Activity Theory in the 1920s and as a "cultural-historical" school of psychology in the early 1930s. A good historical review of the Activity Theory and its development has been covered in detail by Leontjev (1989). According to Kuutti (1995), Activity Theory was firstly introduced and applied within soviet psychology, however, today the theory is used far beyond the original background. The theory is now applied in a multi-disciplinary approach **(**Kuutti, 1995).

Activity theory helps to explain and gain an understanding of the phenomenon, this then makes this theory applicable for analysis, study design, and describing. This theory helps the researcher to describe and understand how and why certain things happen, its main focus is to explain rather than predict (Karanasios & Allen, 2013). According to Karanasios and Allen (2013:4) Activity Theory allows the researcher to study and understand "*how actors bring about change in the local community through ICT and how the ICT intervention may lead to new arrangements in the community, a re-conceptualisation of its potential uses and become interlinked with other activities*". This theory provides an approach to study focusing on the interrelationship that exists between ICT and actors within a specific context. Karanasios (2014) notes that the activity theory allows for "*naturalistic or qualitative generalization and can be used in the interpretation and explanation of data".*

Activity Theory was not selected for this study because is not yet operationalised enough, which presented a limitation as few methods and techniques are available to solve these specific problems. According to Kaptelinin (1996), it would be unrealistic to just accept this theory and expect results immediately as it is still in its infancy. Activity Theory was initially conceptualised to study psychological theory of individual activity. This then present a limitation as the theory refers to `the user' as an individual. This theory's view is not true as the user now spans over just an individual to also include groups and organisations.

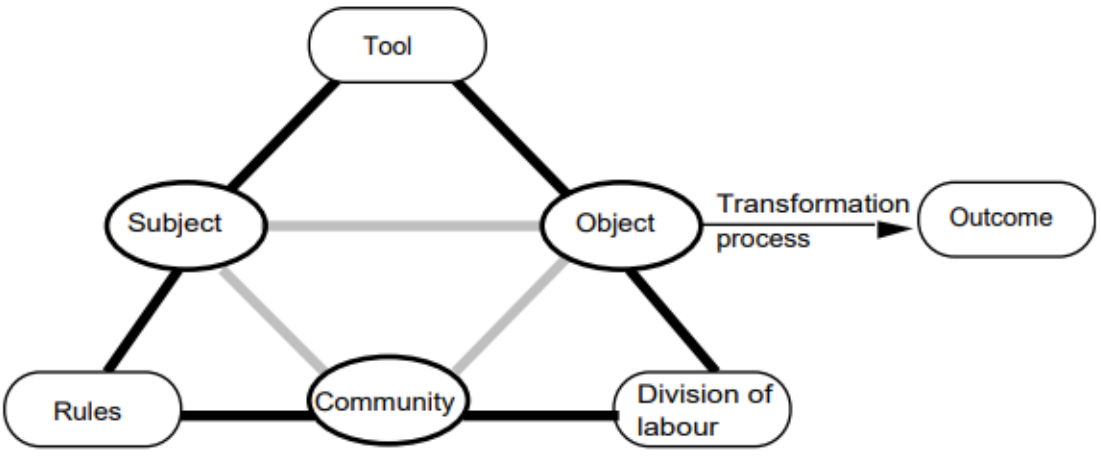

Figure 11: The Activity Theory
Source: Kuutti (1995)

Sen's Capability Approach (CA)

Capability Approach is highly associated with Amartya Sen and Martha Nussbaum (Sen, 1999; Nussbaum, 2003). This approach is closely associated with the works of Amartya Sen, as he clearly articulated this approach in the 1980s. The CA has since gained popularity in ICT4D research as it conceptualises development as freedom of choice (Thapa & Saebo, 2014). Sen conceptualises development as freedom and the development of individual capabilities (Sen, 2001). The CA defined development as "*a process of expanding the real freedoms that people enjoy to lead the lives they have reason to value*" (Kleine, 2010:108). This theory views development as freedom of an individual to choose, given to live the life they value, given the confines of their structures and resources. According to Thapa *et al.* (2012), the CA shows that capabilities present the individual with the freedom to better make decisions to lead the kinds of life they value. The CA has two variables, the first focuses on realised achievements (functionings) and the second one on effective possibilities for achievements (capabilities) (Thapa *et al*., 2012) and these core concepts are used to analyse their quality of life.

According to Zheng *et al.* (2018), the CA provides the researcher with a holistic view to allow evaluating the development outcome in terms of "*well-being, choices and the agency of individuals to actualize available opportunities*". Sen presents an all-inclusive perspective on development where development is not exclusively associated with economic growth but also focuses on human well-being, freedom to choose and capabilities (Kleine, 2010). According to Walsham (2017), Sen's CA has been adopted in most ICT4D studies as a guiding framework to help researchers understand if a link exists between ICTs and development or the ICT4D analysis. The Sen's Capability Approach (CA) was applied in many studies as it is deemed to be more suitable and provides a more appropriate lens that will help the researcher understand how ICT may foster development (Zheng, 2009).

The CA focuses on development of individual capabilities which is the base of ICT4D literature, where ICT is viewed as an enabler that can help enhance an individual's capability through empowerment and knowledge. While Kleine (2010) is of the view that the Sen's CA is a good theory to study ICT4D, she then notes the limitations presented by CA and argues that the process of choosing capabilities should be an individual choice. She also argues that while the model retains open-ended development outcomes that do not presuppose individuals' choices.

The Sen's CA was not appropriate for the purpose of this study because the way concepts of functioning and capabilities are usually obscurely defined which makes it difficult to operationalise (Gasper, 2002). According to Gasper (2002:9), "*Sen's conception of freedom seems too focused on range of (valued)*

choice, and neglectful of other aspects of being and need". This has led to difficulty in the conceptual richness of CA and making it difficult to operationalise. Another major limitation of Sen's CA is that the framework does not identify a coherent list of valuable capabilities across all people (Clark, 2005). With no coherent list of important capabilities, it becomes difficult to supplement the framework. The CA is also not applicable for this study given that it presence of potential disagreements about the capabilities given that there is no coherent list of capabilities to stick to. The CA is also not applicable to this study because the CA information requirement is very high because the researcher needs to acquire a large data set for multiple functionings. According to Clark (2005), Moving from functioning to capability can be a complicated process as additional information will be required on counterfactual choices and actual choices.

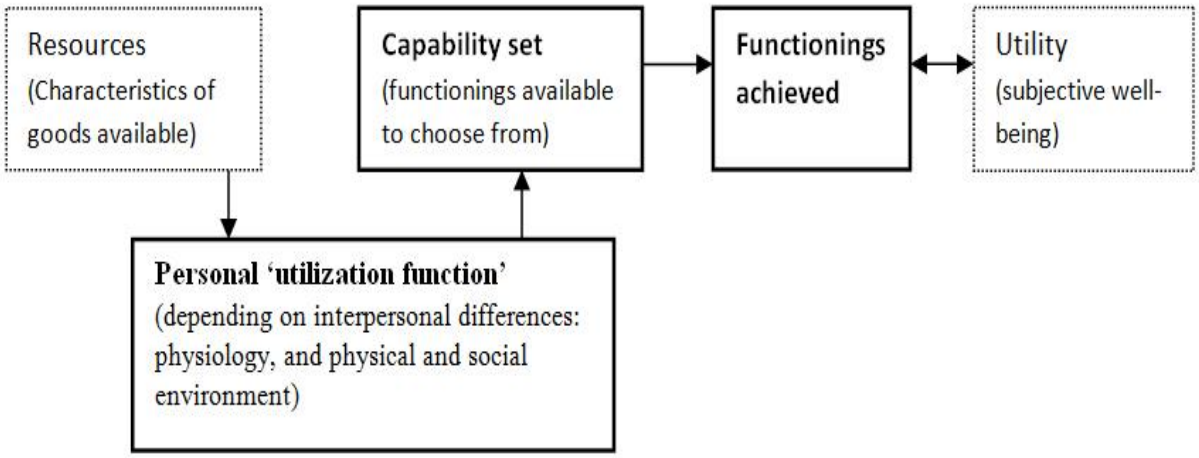

Figure 12: Sen's Capability Approach (CA)
Source: Sen (2001)

The information chain

Heeks and Kanashiro (2009) used the information chain in their study on how ICTs impact on reducing remoteness. The study focused on the technology of connection namely information and communication technology. The model was developed by Heeks (2002) and the model draws from the information systems discipline by looking at how raw data gets transformed into output (organisational value) and also focuses on ICT literacy. However, the model looks beyond the basic notions of 'computer skills'. The model also draws some of its variables from sustainable livelihoods framework to "*incorporate the notion that resources are a key component in producing development results*" (Heeks and Kanashiro, 2009:322). The information chain model theoretically demonstrates how data is processed into information by an individual to help achieve outcomes desired by an individual. According to Heeks (2002, 2005), the information chain model identifies four resource categories that are required by those making use of data, these resources assists an individual to transform data to information and achieve desired outcomes.

- Data resources: users will require availability of relevant data resources.
- Economic resources: Users will then need economic resource like money, technology and skill in order to better access the data resources.
- Social resources: Users must be knowledgeable, confident and have the motivation to access, assess and apply the data, to enable them to build trust of the data source.
- Action resources: they Users must then be able to apply their learning to make decisions on the information resources. This requires economic resources plus resources like empowerment.

The information chain explains how ICT resources and information are assessed, accessed and applied by an individual. The model explains how economic resources and social resources affects how an individual access, assess and apply the information. The model also shows how access, assessment and application is not enough, the individual must be able to act upon the information.

This model is very new and hasn't been applied in detail in ICT4D research making it difficult to find enough literature to support its use. Given that this is a cross sectional study, this presents a great risk in the completion of the study. This model will not be used to avoid this limitation. However, this model can be applied in future research. The model is visually depicted below in Figure 14.

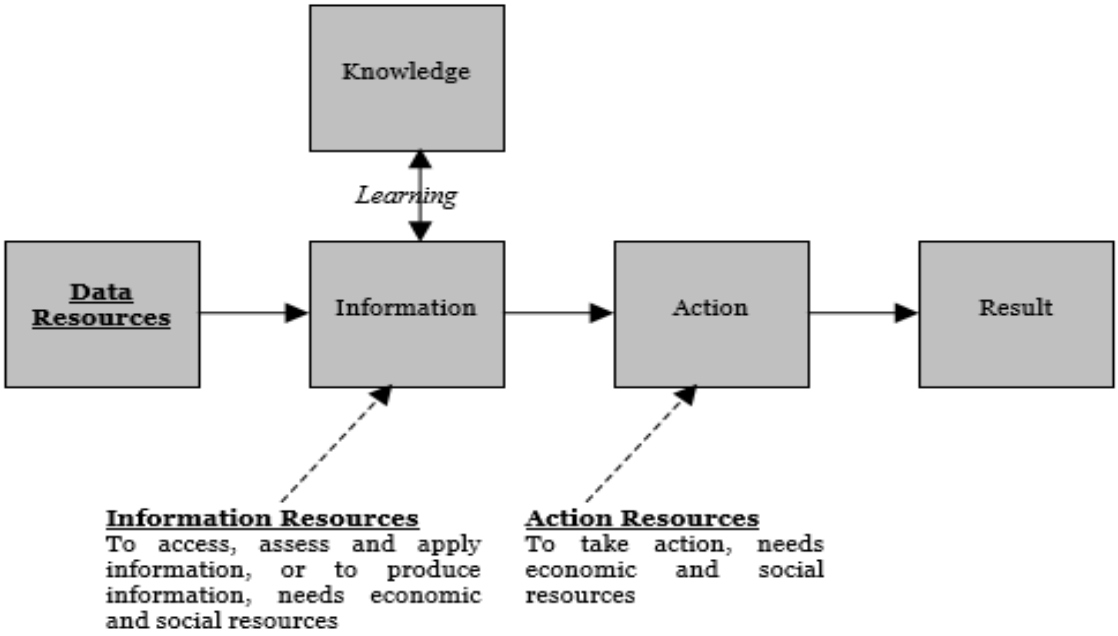

Figure 13: The information chain.

Source: Heeks and Kanashiro (2009).

3.4 Theoretical underpinning this study

The Choice Framework (CF)

Given the limitation presented by the ANT, Activity Theory, Sen's CA and the Information Chain model, discussed in the literature review, this study adopts the Choice Framework (CF). This framework can be effectively adapted to understand the impact of free public WiFi hotspots on development in the CoJ. According to Andoh-Baidoo (2016), ICT4D communities are now aware of the fact that when analysing the role of ICT on development, economic development must not be the only aspects that researchers focus on. Andoh-Baidoo (2016) proposes the use of the Kleine's choice framework as it presents a systematic development process in ICT4D.

The Choice Framework was developed by Kleine (2010) to specifically study ICTs and how they are broadly applicable to empowerment and development. The CF is based on Sen's capability approach, it was developed to operationalising Sen's work on capability of the holistic and systemic view and also takes some elements from the Sustainable Livelihood Framework (SLF) (Kleine, 2010). Capability approach of Sen's (1999) views development outcome as freedom that is facilitated by an individual's participation as a means and an end. This view is also reflected in the CF as the extent to which principle development outcome and empowerment are as a result of the individual choice. Kleine's CF (2010) operationalises a model of how individuals make choices provided that there exist structures around them, as well as their own agency, in order to work towards self-defined development outcomes. The model argues that the development outcomes are dependent on how an individual combine "*the 'resources' which give them agency and the 'structures' within which they operate*". According to Gomez, Reed and Chae (2013), in the CF, empowerment is critical and is as a result of the interaction between agency and structural factors.

The CF provides the ability to study evaluation and planning of development activities beyond being an applicable process analysis (Kleine, 2010). The theory was used understand how ICT policies impact the livelihoods of rural Chilean residents (Kleine, 2007). According to Coelho *et al*. (2015), the CF is primarily focused on the results of development in which, according to Kleine (2010), development is as a result of the individual's choice itself. The outcome of development is considered secondary as it is dependent of the individuals choices. For example, for an individual to facilitate communication among people or increasing their knowledge, ICTs will have to be applied to get this desired outcome. However, the individual firstly has to make a choice to engage with ICT artefact that will better achieve this desired outcome. According to Attwood *et al*. (2013), the CF helps the researcher to analyse how individuals apply their varied ability to empower themselves and live the life they value and desire. The CF is made up of four constructs namely: dimension of choice, agency, structures and finally, development outcomes. These constructs are discussed below.

Dimension of choice

Individuals use their agency given the resources at their disposal to negotiate the social structure to enable them to make choices that enable an individual to achieve the kind of life they want to live and value. According to Kleine (2010), development is based on the ability of an individual to expand their freedom to choose. Kleine and Sen are of the same argument that the principal means of development is choice. According to Kleine (2010), the existence of the dimension of "sense of choice" always plays an important role for any technology focused research that is new to the respondents. Kleine (2010) explained the "use of choice dimension" as the ability of an individual to actually makes the choice and the "achievement of choice" refers to whether the outcome matches the choice expressed. The choice aspect is very complex and the Kleine's choice framework (Kleine, 2010, 2011; Kleine, Light, & Montero, 2012) tried to address this complex dimension. Kleine (2010) differentiates between four dimensions of choice: existence of choice, sense of choice, use of choice and the achievement of choice and they are discussed below based on Kleine (2010):

- Existence of choice: this refers to the different possibilities available to an individual to choose from.
- Sense of choice: awareness of an individual of the existing choices and its possibilities.
- Use of choice: action an individual takes on the choices selected from the existing set of choices.
- Achievement of choice: the outcomes of the choice selected must match the individual's expectations.

Agency

Agency is the subject of development in CF. According to Kleine (2010), in the CF, personal characteristics of an individual such as gender, age and ethnicity etc. contributes to the resource portfolio scope and scale. The resource portfolio consists of ten types of resources namely: financial, natural, material, psychological, geographical, social, cultural and educational, information and health resources. These resources need to be taken into consideration despite the fact that they result in specific challenges for mediation. According to Coelho *et al*. (2015), agency can influence access to ICT which then will impact the development outcomes, however, agency can be less relevant in certain contexts. Kleine (2010) identifies the ten types of resources as follows:

- Material resources: materialistic objects such as computer hardware, machinery, broadband infrastructure and other objects that are required.
- Financial resources: financial capital such as cash, shares, savings and more.
- Natural resources: geomorphological and climatic conditions these can include the availability of clean water absence of natural disasters and any surrounding nature.
- Geographical resources: location and relative distances.

- Psychological resources: psychological aspects such as the an individual's self-confidence, creativity, resilience etc.
- Cultural resources: social constructs that distinguishes the social behavior of particular people or society, the ideas, customs.
- Social resources: social capital which she defined as "the aggregate of the actual and potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition – or in other words, to membership in a group – which provides each of its members with the backing of the collectivity-owned capital, a credential which entitles them to credit, in the various senses of the word" Kleine (2010:111).
- Educational resources – formal and informal education and skills an individual has acquired.
- Health resource – the WHO (1948) defined health as "a state to complete physical, mental nd social well-being and not merely the absence of disease or infirmity". Health resource is then the possession of health as per the definition of health above.
- Information Resource: informational capital which Kleine (2010) argues that the primary stage of knowledge acquisition is access to information resources. This then allows transforming information through technology to produce meaningful knowledge.

According to Kipo (2013), agency is as critical like structure as they are both critical in social sciences and their relationship in social theory is crucial. According to Giddens (1979; 1984), agency is defined as individual capacity to independently act, make decisions and choices given their social structures. Kleine (2011:121) define agency as "the capacity to make meaningful choices and measured by an individual's asset endowment, consisting of psychological, informational, organisational, material, social, financial and human assets". Agency allows an individual to make and remake the things they value and desire. Kipo (2013) believes that individuals exercise agency in their daily lives.

Specific cultural schemas and resources available to an individual (structures) shapes individual agency. It is important to note only within the given confines of the structures can agency be realised through the interaction between agency and these structures. In order to achieve the desired empowerment or development outcomes, individuals have to utilise their agency to navigate the structures around them. In the CF, there exist a double arrow systemic relationship between agency and structure, indicating a continuous interaction between agency and structures around them. In the CF; individuals' agency can with the resource portfolios at their disposal, helps an individual to negotiate a social structure in order to achieve, by means of their active choices. According to Giddens (1979; 1984), agency and structure are constantly co-creating. Kleine (2011) argues that agency is used by individual to negotiate the structures in order to extend their agency and also change the structures.

Structures

In the choice framework, structural constraints are important just like individual agency. In the CF diagram presented below, structure is placed above agency as it directly influences an individual's agency. Structures are directly linked to agency and would not exist without agency (Giddens, 1979; 1984). Giddens (1984:24) defined structure as "rules and resources recursively involved in institutions". According to Kleine (2010) structure directly influences an individual's agency, which includes dimensions of access, such as affordability, availability and capabilities needed for utilising different ICTs to achieve developmental outcomes. Structures include institutions and organisations, discourses, policies and programmes, formal and informal laws and norms and access to ICTs that can influence individual agency. Structures are external to individual agency and tend to serve as constraints to agency (Kipo, 2013).

While structures tend to serve as constraints, Kleine (2011:124) believes that **"s***tructural constraints need to be recognised as being at least as important an element in the process as individual agency, but ultimately, and particularly in democratic societies, structures are always co-constructed by a number of individuals*". For the purpose of this study, structures are known. The City of Johannesburg is the structures under study. Free public WiFi is the ICT artefact understudy. This study will also attempt to understand the structures that influences agency, however, the structure has been identified and the context of this study has been discussed. The structure for this study is the CoJ free public WiFi hotspots and all other resources required to access these hotspots.

Development outcomes

The principle development outcome is the freedom of an individual to choose (choice itself). The secondary development outcomes are based on the principle choice of an individual to allocate the resources on task/thing that will enable them to achieve the life they value (Kleine, 2010). The principle and secondary development outcomes are presented in Figure 15. This study attempts to understand the development outcomes of free public WiFi hotspots as perceived by the CoJ residents.

3.5 Theoretical lens selected for the study

The Choice Framework will be used in this study to analyse and operationalise experiences of free WiFi hotspots use in the CoJ, alongside user experiences that reveal how these free public WiFi hotspots together with the characteristics of users and their various sets of resources, impact the development of CoJ residents. According to Gomez, Reed and Chae (2013), the body of knowledge on human capabilities proves that there is a need for researchers to understand the effects of technology as perceived by the people affected. The CF will provide this research with that capability to study the

impact of free public WiFi hotspots on the development of the CoJ residents as perceived by the people affected.

According to Andoh-Baidoo (2016) ITC4D research around the impact of ICT on development should move away from viewing development solely from economic aspect and however view development as systematic process. Kleine's (2010) CF supports this view on ICT4D. Kleine's (2010) choice framework proposes that ICT4D research must try to understand the impact of ICTs on development and issues to how agency and structures influences resources empowerment as well as the developmental outcomes thereafter.

The theory is relevant for this study as resources, choices and outcomes are captured by the CF presenting a holistic analysis of the impact as well as getting an understanding of the impact from the end user's lived experience. The CF also presents the dimension of "sense of choice" which always play an important role for any technology focused research that is new to the respondents. According to Coelho *et al*. (2015), the CF allows one to see the complexity of interventions in systems while placing the choice at the centre of process analysis.

The CF is an analytical Impact Assessment Framework (IAF) that looks at ICT as an independent variable and developmental outcome as a dependent variable of ICT, structures, choices and agency. According to Attwood *et al*. (2013), ICT4D has lacked a robust theoretical base since the literature in ICT4D focuses more on 'structuralist' and supply-side approaches, with less attention to individual agency and the demand-side approaches. This study considers agency and structure influence in developmental outcome of ICTs, the Choice Framework (CF) developed by Kleine (2010) is then proposed as an impact assessment framework. This framework will help the researcher to analyse people's varied ability to empower themselves to live the life the desire and value. The researcher also understands that developmental outcomes are lived experience, the researcher will assess the impact from the residents' perspective. Therefore, the selection of Choice Framework is deemed appropriate for this research.

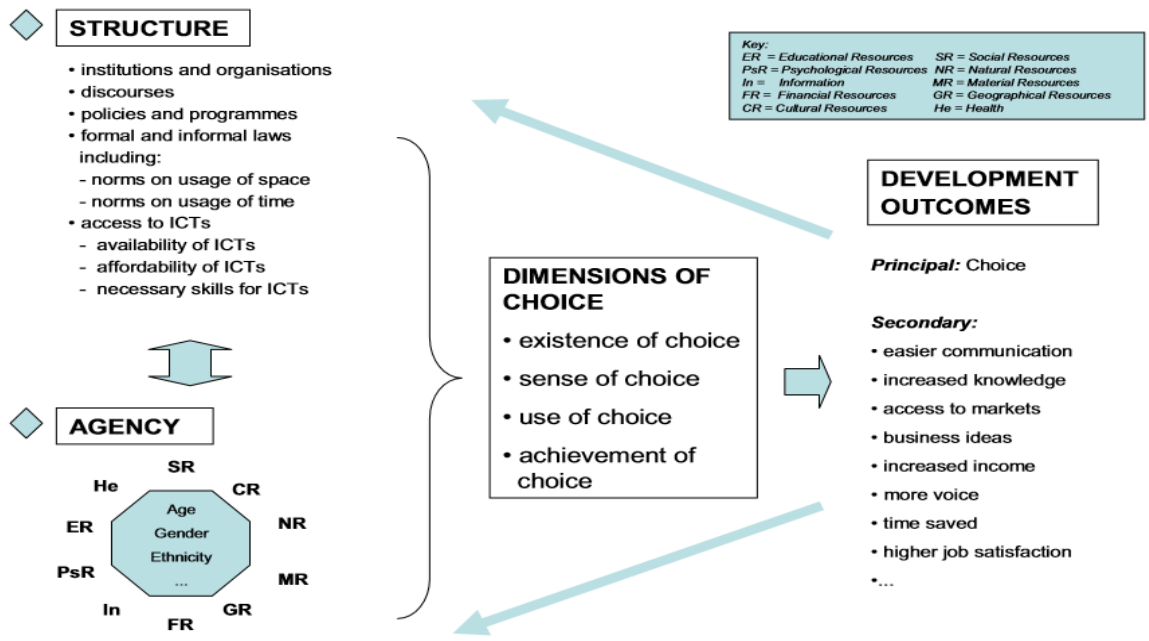

Figure 14: The Choice Framework.
Source: Kleine (2010)

3.6 Chapter conclusion

Chapter three presented as theoretical lens that has been adopted for this study. The chapter also present a background literature describing the theoretical lens selected as well as the justification for why the theoretical lens was selected. The Choice Framework is selected to underpin the study and the description of the theoretical concepts that make up this framework are discussed. The next chapter will discuss the research design and methodology used in the study.

Chapter 4: Research Design and Methodology

4.1 Introduction to Chapter 4

This Chapter discusses the research methodology and design selected for this study. The ontological and epistemological assumptions selected for the study are presented and motivation on why they are selected is also presented. The chapter also highlights how issues of ethics and limitation experienced were dealt with. The chapter also details how reliability and validity of the study were dealt with.

4.2 Research methodology

Kothari (2004) defined research as an organised and scientific quest or a search for knowledge that is conducted through tried and tested research procedures and methods. Research methodology can be described as a systematic approach that the researcher adopts to detail the plan or structure that will be followed in conducting research (*Saunders, Lewis & Thornhill*, 2009). Research methodology helps to detail the methods, processes, techniques and procedures that will be adopted in the study. Research methodology details how research will be undertaken as well as the philosophical assumptions upon which the research will be based (Saunders *et al.*, 2009).

For the purpose of this study, Saunders *et al* . (2009) research onion was used to help the researcher in detailing the plan on how the research was carried out as well as the assumptions that were applied in this study. The researcher also used the research onion to depict the philosophical stance that shows how they view the world. The research onion consists of six significant research process layers, visually depicted below in Figure 16. The next section describes the research processes followed when conducting this study, the methodology and all methods employed to collect and analyse data.

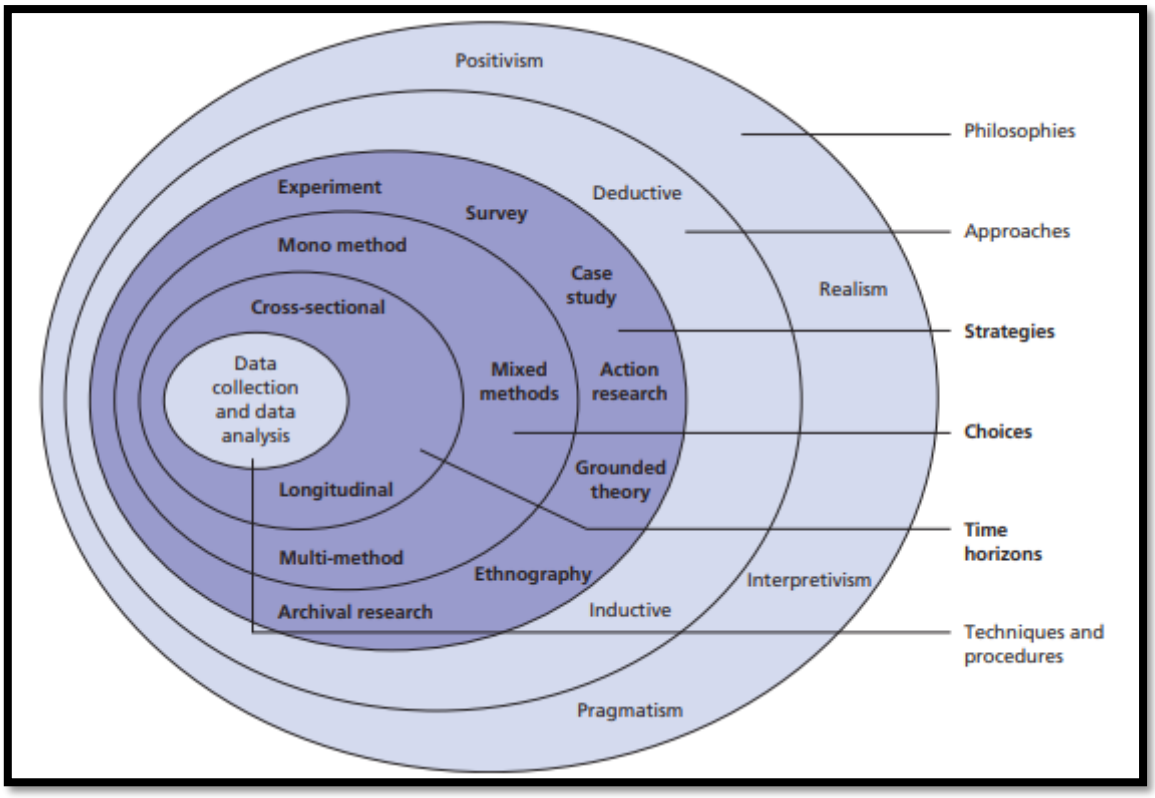

Figure 15: Research onion
Source: Saunders *et al.*, 2009

4.3 Research ontology, epistemology and paradigm

Ontological assumptions, epistemological assumptions that informs a paradigm employed in the study are important when conducting research Grix (2004:59) defined **ontology** as the study of "claims and assumptions that are made about the nature of social reality, claims about what exists, what it looks like, what units make it up and how these units interact with each other". Ontology is mainly concerned with studying the nature of reality. Gray (2013:19) defined ontology as "the study of being, that is, the nature of existence and what constitutes reality". The ontology selected informs the epistemology for the study.

Crotty (1998:3) defined **epistemology** as "the theory of knowledge embedded in the theoretical perspective and thereby in the methodology". Epistemology is primarily focused on the creation of knowledge and understanding. Research paradigm is made up of ontological and epistemological assumptions.

The term paradigm was firstly coined by Thomas Kuhn in his 1972. A research paradigm refers to the belief system or how the researcher views the world and it is grounded in a set of assumptions (Batthecherjee, 2012). These assumptions and the researcher's belief system guides the investigation and influences how the research problem is addressed (Saunders *et al.*, 2009). According to Saunders

et al. (2009), there exist four belief systems in research namely: positivism, interpretivism, realism and pragmatism. Of the four, there are two commonly used belief systems in research, namely positivist and interpretivist paradigm. Positivist and interpretivist paradigm are briefly discussed below.

Positivism paradigm traditionally follows the natural sciences research process where research data and results are empirically gathered, tested, measured and observed through scientific approaches like experiments (Greener, 2008; Saunders *et al*., 2009 & Batthecherjee, 2012). This paradigm is appropriate when the data will be used in model testing or proving or disproving the hypothesis formulated, which can then be used to measure the external reality of the study (Saunders *et al*., 2009). The philosophical assumption guides the approach that the researcher can follow, whether to follow the deductive or inductive approach (Greener, 2008), this paradigm usually follows the deductive approach. Positivism paradigm favours quantitative methods of data collection and analysis which allow for generalisation of the findings.

Positivist researchers are often referred to as a "resource researcher" due to their reliance on resources of scientific nature to conduct their research. Proving or disproving the hypothesis are some of the ways qualitative research is conducted (Saunders *et al*., 2009). Positivist paradigm remains in the scientific domain by only allowing objective statements where the researcher is independent to the data generation process and has no influence on the data end results (Saunders *et al*., 2009). According to Oates (2006), their world exists with no influence from human beings. Positivists believe that their world is not subjected to multiple interpretations, there is only "single truth on reality" where personal values and beliefs are independent to the discoveries of the world (Oates, 2006; Saunders *et al*., 2009). According to Batthecherjee (2012) the positivism paradigm primarily relies on quantitative data generated from laboratory experiment or survey, however, qualitative data can also be applied to better explain the phenomenon in detail.

Interpretivism paradigm is based on the social sciences philosophies that try to explain human beings' differences as social actors and the multiple subjective meanings that exist among the social actors (Saunders *et al.*, 2009). "Feelings researcher" is the term often used to refer to researchers who follow this paradigm because their feeling, personal values, attitudes, perspectives, beliefs and assumptions play a role when data is collected and analysed (Saunders *et al.*, 2009). The interpretive paradigm allows subjective statements and the researcher is part of the data generation process and can influence data collection process as well as the findings (Saunders *et al*., 2009). According to Batthecherjee (2012), interpretivists believe that the world is subjective and that there is no single truth or reality; the way people view the world is subjected to their experiences, perspectives, attitudes and social setting. Meanings are socially constructed by social groups, and changes as the social actors evolve (Saunders *et al.*, 2009). According to Oates (2006), the interpretivist's world is not structured but rather random

and the findings are not for generalisation but rather to understand a specific social group in a social setting. Data collection and analysis are usually guided by the social setting. An interpretive approach understands the phenomenon in detail by following the non-numeric qualitative methods like interviews or observations to collect in-depth data from relatively smaller samples as compared to positivism paradigm, however quantitative methods can be applied to simplify the phenomenon (Oates, 2006; Batthecherjee, 2012). Table 4 below presents the ontological and epistemological assumptions per research paradigm.

Table 4: Ontology and epistemology per research paradigm

	Positivism	**Interpretivism**
Ontology	• single truth or reality exists • Reality cannot be controlled by the researcher. The research is external to the process. • Only objects meaning exist. • Reality can be predicted and can be captured by our senses	• There exist multiple truth and reality. • Individual's interpretation indirectly crease reality in a social setting and can be subjective. • Results can never be generalised as all events are unique based on a social setting • Meaning of events is created based on peoples' interpretation • Multiple perspectives exist on one incident. • Interpreted meaning and symbols determine causation in social sciences
Epistemology	• Reliable and valid tools are used to measure reality • Natural sciences methodologies are applied to investigate social reality. • "Truth can be attained because knowledge rests on a set of firms, unquestionable, indisputable truths from which our beliefs may be deduced" Mack (2010:7) • Theory and hypothesis are used to deductively generate knowledge • Knowledge is objective.	• Reality is subjective and is based on individual interpretation • "Knowledge is gained through a strategy that respects the differences between people and the objects of natural sciences and therefore requires the social scientist to grasp the subjective meaning of social action" Mack (2010:8) • Theory is creased from the knowledge gained inductively • Knowledge arises based on context and cannot be used for general interpretation. • Personal lived experience is used to gain knowledge

Source: Crotty (1998); Mack (2010).

Following on from the ontology and epistemology breakdown in the above table, Figure 17 below depicts the research process from epistemology to methods.

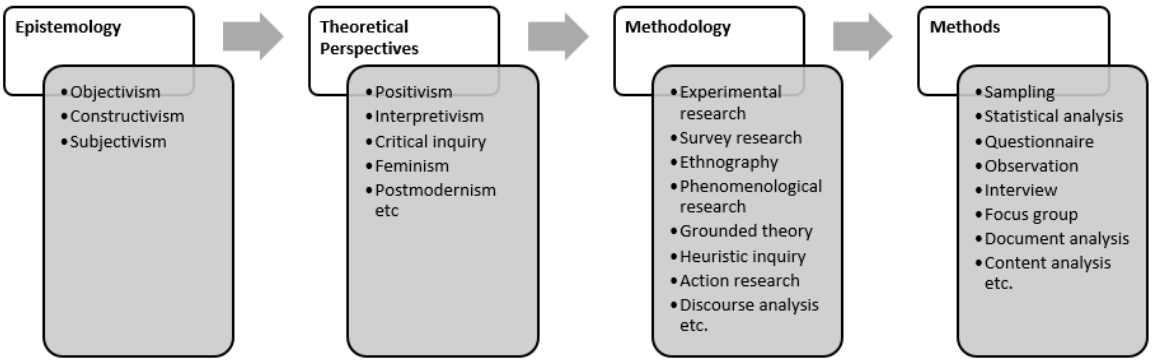

Figure 16: Research process

Source: Adapted from Gray (2013:19)

This study was guided by the interpretivism paradigm. Interpretivism is based on the social sciences philosophies that try to explain human beings' differences as social actors and the multiple subjective meanings that exist among the social actors (Saunders *et al.*, 2009). Rather than having a single view of the world, the researcher identifies everyday meaning that respondents have to the phenomenon, these meanings are socially constructed by the social groups (Coleman, 2017).

This research favoured interpretivism paradigm in an attempt to answe and understand the identified research problem. The research question for this study is concerned with understanding what is the impact of free public WiFi hotspot on the development of residents in the CoJ. The positivist paradigm was not deemed appropriate to answer this question as the question may have multiple interpretation and explanations from the respondent's persepctive. Positivist paradigm was also not deemed effective enough in helping the researcher to investigate a complex social phenomenon as it is concerned with facts and generalisation of the findings not taking into account the context and social structures of the respondents (Batthecherjee, 2012).

The interpretive paradigm was selected for this study because according to Klein and Myers (1999) it enabled the researcher to gain deep insights into the phenomenon of interest while considering the nature of the subject and real-world complexities. The selection of this paradigm helped to facilite a richer understanding of the impact of free public WiFi hotspots on development. Given that answering this question required input from respondents lived experiences, this interpretive paradigm is more appropriate when investigating lived experiences. Considering that the researcher's experiences and

personality may directly or indirectly effect how the data was collected as well as the analysed for understanding. This paradigm is also applicable as the researcher's presence also affected the context in which the study is conducted and data is collected.

The interpretive paradigm was selected as its main purpose is not predicting the future or generalisation of the findings, but rather to help the researcher to understand meanings. The purpose of this research was not to predict or generalise the findings, but rather to help the researcher in understanding the phenomenon through meanings that people assign through their personal lived experiences. The researcher is of the philosophical stance that knowledge of reality can only be understood or created through social interactions and may not to be analysed though quantitative experiments.

4.4 Research approaches and design

There are three commonly used research approaches; they are inductive, deductive and the combination of both (Saunders *et al*., 2009). According to Batthecherjee (2012) interpretivisim follows an inductive approach to further develop insights of the phenomenon or to build theories from the in-depth data collected and patterns that were identified from the analysis. According to Ghauri and Gronhaug (2010) in this approach, empirical observations are used to draw conclusions. Coleman (2017) notes that the interpretivism paradigm is not limited to an inductive approach, either deductive or inductive approach or a mixture of both can be applied. This study adopted inductive approach to further develop insights of the phenomenon and to build theories from the in-depth data collected and patterns that were identified from the analysis. The inductive approach helped the researcher to gather detailed insights on the impact of free public WiFi hotspots on development.

This study followed the explanatory research which is also referred to as Causal Research. According to Batthecherjee (2012) how things happen and why they are happening are some of the questions that explanatory research tries to answer. Coleman (2017) also emphasised that the objective of explanatory research is to explain the phenomenon, why certain events took place and their outcomes. According to Saunders *et al*. (2009), explanatory research also tries to establish and then explain the relationship that exists between the variables. Explanatory research can also isolate and manipulate the independent variables to gauge to what extent does the independent variable result in an effect to the dependent variable (Ghauri & Gronhaug, 2010). According to Batthecherjee (2012) explanatory research can apply qualitative method, quantitative method or both. Qualitative method is usually applied when the phenomenon requires theoretical and interpretation skills guided by personal experiences, insights, and intuition. Explanatory research focuses on explaining the problem and behaviours of the observed phenomena. Explanatory research focuses on answering the why and how types of questions, while of

approaches focuses on answering the what, where, and when questions of a phenomenon (Batthecherjee, 2012).

When conducting interpretivist research, the researcher is not independent to the research process, therefore the researcher influences data collection and analysis process (Saunders *et al.*, 2009). To achieve research rigour, the research needs a research instrument to ensure that data collection process observes some sort of a protocol (Batthecherjee, 2012).

To gather in-depth insights and understand the impact of free public WiFi hotspots on CoJ residents in detail, this study followed the non-numeric qualitative research method to gather insights from relatively smaller sample (Saunders *et al.*, 2009:119). Qualitative research enables a researcher to study complex social interactions, structures and processes (Bhattacherjee, 2012). According to Denzin and Lincoln (1994), qualitative researcher methods enable the researcher to investigate the research problem and questions under study in the natural settings of the respondents, in order to allow the researcher to gain an understanding of social structures and then be able to interpret phenomena in terms of the meanings people bring to them.

This approach is in-line with the interpretive paradigm. The researcher aimed to address the phenomenon of ICD4D and better understand the impact of WiFi hotspots have on development of the CoJ residents. To help the researcher achieve this aim, detailed information and understanding had to be collected of which cannot be sufficiently addressed by the quantitative method. Research strategies like case studies, ethnographies, grounded theory, participatory action research, phenomenology and narratives can be applied in qualitative interpretive study, the research strategy adopted dependent on the research question under investigation and the objectives of the study (Batthecherjee, 2012).

Quantitative research methods were not selected as they ignore social and cultural influences that may have an effect on the respondents. This research method assumes a value-free and objective report which sometimes results in the researcher not having any contact with the respondents or the field where data will be collected. Quantitative research methods sometimes collect statistical data and analyse this data without taking into account and examine background motivations which results in the researcher failing to give a complete picture or reductionism (Coleman, 2017). A quantitative study is also interested in the replicability of the study and results (Bryman, Bell, Hirschsohn, dos Santos, du Toit & Masenge, 2014). While this is a good approach to ensure validity and reliability, the purpose of this study is not to ensure replicability, but to understand meaning and how social structures affect the lived experience of respondents and how the respondents experience the impact of free WiFi on their development. Given the reasons why quantitative research method is not suitable for this study, and as an interpretive researcher, the researcher in this study used qualitative research method as the researcher

is of the belief that to gain knowledge of social reality; the researcher must engage in sense-making rather than hypothesis testing.

4.5 Time horizon

The cross-sectional and longitudinal are the two types of time horizon a study can adopt. According to Saunders *et al.* (2009), cross-sectional study is viewed as a snapshot while multiple snapshots are referred to as a longitudinal study. Time frame of a study can follow a snapshot or multiple snapshots over a period of time. Due to the longitudinal effects limitation and time frame to complete this study and budget limitation, a cross-sectional study was conducted. The impact of free public WiFi hotspots was only investigated at the single point in time when data was collected.

4.6 Targeted population

Population can be defined as the full set from which the sample will be taken from, the full set can include all people or items referred to as the unit of analysis (Saunders *et al*., 2009). The unit of analysis with the desired characteristics may be an individual, group of people, country, an organisation object, or any other unit of analysis of researcher's interest (Bhattacherjee, 2012). The population for this study comprised of residents of the City of Johannesburg, Gauteng. Gauteng is the most populous province in South Africa with an estimated 14 million residents, with the City of Johannesburg being the largest metropolitan area with an estimated 4.4 million residents (Statistics South Africa, 2011). The Statistics South Africa (2018) Q3 quarterly labour force survey shows that 3.8 million of the population in Johannesburg consist of a 'working age' (15-64 years old) group of individuals involved in different economic activities like higher education, employment or informal business. The population for this study was the 3.8 million 'working age residents of the City of Johannesburg, this constitute more than enough population for this explanatory study.

4.7 Sample selection and size

Sampling is the process that helps the researcher to select a sample from the identified population with the desired characteristics to observe and gather data about the sample (Bhattacherjee, 2012). Saunders *et al.* (2009) categorises the sampling methods into two types and explained the two sampling designs as follows:

Probability sampling can be defined as a process where a sample of the study is randomly selected giving each unit from the sample a chance of participating in the study.

Non-probability sampling uses intuitive judgment or the researcher's knowledge to select a sample. According to Bhattacherjee (2012), when non-probability sampling technique is applied, sampling error cannot be established. Unlike probability sampling that is focused on generalisability of the findings, non-probability sampling technique's desire is to gain a deeper understanding of the subject.

Saunders *et al*. (2009) Sampling techniques are visually depicted below.

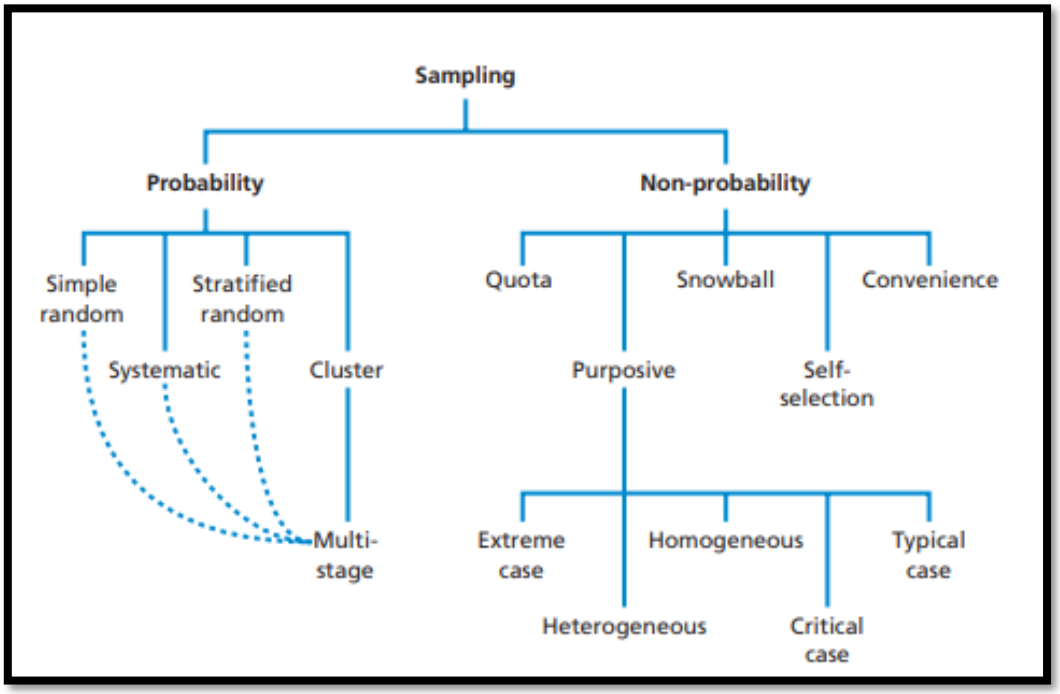

Figure 17: Sampling techniques
Source: Saunders *et al*. (2009)

This qualitative study followed the non-probability sampling approach where purposive or judgemental sampling was employed. According to Saunders *et al*. (2009:237), "purposive or judgemental sampling enables you to use your judgement to select cases that will best enable you to answer your research question(s) and to meet your objectives". When purposive sampling is applied, the researcher consciously looks out for the respondent based on the predetermined criteria that the respondent must meet. According to Saunders *et al*. (2009), the researcher has various ways of identifying the respondent like using the researcher's own relationships, referrals from peers and referral from respondents (i.e. snowballing). This sampling method is usually employed when the researcher would like to select cases that are informative about the topic under study from a small sample (Saunders *et al*., 2009).

The purposive sampling method is applicable to this study as the sample frame is predetermined. According to Saunders *et al*. (2009:239), there are five purposive sampling strategies commonly used:

"*extreme case or deviant sampling, heterogeneous or maximum variation sampling, homogeneous sampling, critical case sampling, typical case sampling*".

When purposive sampling is employed, the results cannot be generalised to represent the total population, however, it is only for the context under study. For the purpose of this study, typical case sampling was adopted. Typical case sampling is usually used to provide an illustrative profile of a phenomenon that represents what is normal or typical (Saunders *et al*., 2009). The purposive sampling strategy that was used for this study is typical case sampling.

Given that the researcher has predetermined criteria that the respondent must meet, the researcher assumes that respondents from townships will have different characteristics and are likely to use the free public WiFi for different tasks, with different results as compared to respondents found in cities or suburbs. The Gauteng City-Region Observatory (GCRO) (2016) conducted the quality of life survey in 2015 and the results shows that only 29.9% of the Gauteng resident have internet connectivity in their household. This study also tried to uncover how the deployment of free public WiFi hotspots has impacted the 70.1% residents who do not have access to the Internet in their household.

The percentage of residents who have internet connection in their household differed per Gauteng region. Johannesburg had the highest on 36.9% of residents who have internet connection in their household, followed by Tshwane on 30.6% while Emfuleni had the lowest at 12.0%. This is an indication that different regions have different social structures that enable or restrict access to internet connectivity. The researcher is also interested in getting a holistic understanding of how social structures and individual agency in different CoJ regions influences how that free public WiFi hotspots impact individual development. To be able to get this holistic view, the researcher has then decided to conduct the interviews in locations with different development challenges, social structures and the end users. The researcher is of the assumption that people in more urban areas will have household internet as compared to people from townships who are mostly struggling to access basic services like electricity, water, health facilities etc.

Table 5: Internet connection in household.

Gauteng Region	Percentage
Johannesburg	36.9%
Tshwane	30.6%
Ekurhuleni	27.1%
Midvaal	26.2%
Merafong	19.5%
Randfontein	18.2%
Mogale City	17.5%
Westonaria	16.4%
Lesedi	13.3%
Emfuleni	12.0%

Source: GCRO (2015)

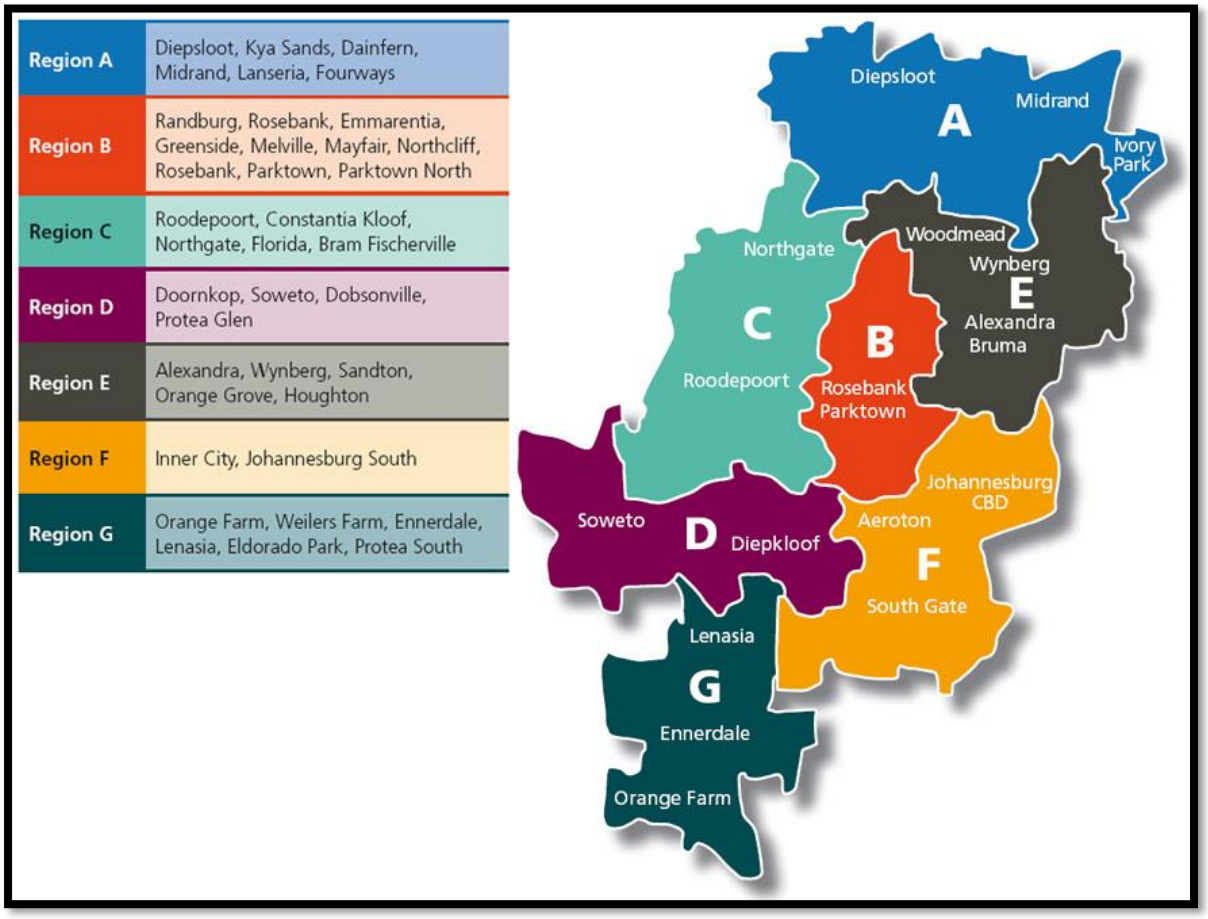

Figure 18: City of Johannesburg regions

Source: Pickitup (2019)

The CoJ has invested in broadband infrastructure and managed to roll out over one thousand WiFi hotspots throughout the seven CoJ regions (see Figure 19). For the purpose of this study, four regions (region D, E, F and G) were investigated. Given that this is a cross-sectional study with time as a limitation, the researcher realised that he was not be able to conduct interviews in all seven CoJ regions, this would have resulted in non-completion given the one year to completiondeadline for this dissertation. The researcher then selected four regions of the seven. Region D, E, F and G were conveniently closer to the researcher and familiar to the researcher. Region D, E, F and G were convenient for the researcher to easily collect the data that is required for the study. Two respondents will be interviewed in each WiFi location located with within the regions previously mentioned (see Table 8). The same number of respondents were selected for each WiFi locationto ensure that the coverage of respondents is evenly spread across all locations.

The choice of these regions was based on the researcher's understanding of the characteristics of the respondents from all these regions. This research assumes that respondents from townships had different characteristics as compared to respondents found in cities or suburbs, hence the mixture of townships such as Lenasia and Orlando East with cities like Johannesburg and Sandton. The researcher also assumes that the sample doesn't have homogeneous characteristics and by focusing on sample with heterogeneous characteristics, the researcher would be able to focus on identifying key themes when it comes to the impact that free public WiFi hotspots has on the development of individuals. According to Saunders *et al.* (2009), heterogeneous sampling enables the researcher to gather empirical insights that will explain the observable themes. The cities and townships selected are all found in the CoJ. The researcher assumed that different locations of WiFi hotspots would yield different type of use, users and development outcomes. The researcher selected respondents from seven free public WiFi hotspots location found in the four regions (region D, E, F and G).

Public libraries, community centres and one precinct were selected as appropriate location for this study because the researcher is of the assumption that people in these locations will have enough time to participate in the study. The researcher assumed that people usually spend more time in public libraries, community centres and precincts as compared to bus stops and clinics. Bus stations and clinics were not selected by the researcher as people spend less time in these locations. The researcher assumed that people in clinics are usually not feeling well and it was probably unlikely for them to be willing to participate in the study. People who are waiting for buses may not have enough time to complete the interview as the interview is expected to take between 15 minutes and 30 minutes, this is not enough time for people waiting for a bus to complete the interview as waiting time in Rea Vaya bus stations is between 10 minutes and 20 minutes depending on the time of the day. Rea Vaya bus stations were also not selected for this study because the stations are usually found in busy roads with high traffic. The researcher was of the assumption that high traffic will cause the interview to not be as smooth as

compared to the places that are relatively quiet. The researcher also assumed that traffic noise will make the recorded audio to not be clear when the researcher starts to transcribe which may result in the researcher losing critical take out from the interview. Swimming pools were also not selected for this study as these are recreational locations and people go to these places to relax and have a great time, they might not be willing to engage in anything that will require them to apply critical thinking.

According to Bhattacherjee (2012), qualitative research study usually selects and uses small, focused samples that are appropriate to the phenomenon of interest rather than large random samples. Interviews were conducted with the identified twelve participants who were conveniently selected from six free public WiFi hotspots and two interviews were conducted in each hotspot. The interviews were conducted by the researcher using the interview guide (see Appendix 4). The detailed breakdown of the twelve respondents who were selected to be part of this research study is presented in the Table 8 below.

Unit of analysis refers to the target of the observation that the researcher is interested in studying such as an individual, group or an organisation. This study was interested in studying and understanding of the impact that free public WiFi hotspots have on the development of CoJ residents. CoJ residents who use CoJ free public WiFi hotspots are the unit of analysis for this study.

Table 6: Sample summary

Regional Location	City of Johannesburg Region	Location	Number of Interviews
Soweto	Region D	Orlando East Public Library	2
		Orlando East Community Hall	2
Sandton	Region E	Sandton Library	2
Johannesburg	Region F	Johannesburg City Library	2
Johannesburg South	Region G	Lenasia Ext 1 Library	2
		Lenasia Ext 1 Community Hall	2

4.8 Data collection

The empirical data collection methods can be either qualitative or quantitative (Oates 2006). This study followed the non-numeric qualitative research method to collect empirical data from relatively smaller sample, primarily surveys (Saunders *et al.*, 2009:119). According to Bryman *et al.* (2014), the qualitative research approach is said to follow less structured interviews as the research ideas is usually formulated more broadly. As compared to the quantitative research where data collection interviews are structured to gain empirical evidence on specified set of research question and to maximise reliability

and validity. According to Bryman *et al.* (2014), a qualitative researcher is interested in understanding the participant or respondent's point of view and the researcher wants rich and detailed answers, to be able to address the research problem. Researchers are often encouraged on departing significantly from the schedule or guide to gather detailed data. In qualitative interviewing, the respondent can be interviewed more than once.

The study used semi-structured, face-to-face interviews using open-ended questions to capture the information from twelve residents of the CoJ. Semi-structured interview can be defined as the interview process where the researcher has a list of questions before hand specific topics that the researcher must cover and this is often referred to as an interview guide (Bryman *et al*., 2014).

An interview guide was used to direct the questions posed to each participant. Broad question were directed at respondents and conversation directions was based on what is relevant to the respondents and their understanding of development. Based on the broad questions that were used, probing questions were also used to get deeper insights and to encourage story telling relevant to the broad question and the study.

Interviews were only conducted only with residents who are using the CoJ free public WiFi hotspots to access the Internet in region D, E, F, and G. This helped the researcher in understanding the impact that these free public WiFi hotspots have on the development of the CoJ residents. The interviews were digitally recorded on the recording device (cellphone voice recorder). Before an interview and recording started, every participant was presented with informed consent and participants' anonymity was as also promised to the respondents.

The researcher approached respondents with an information letter advising the respondents of the purpose of the study and ethical brief was also discussed with the respondent. All the interviews were recorded as digital audio files, later transcribed to ensure that no meaning from the interviews were left out. Field notes were also captured when on site and were then linked to the correct date and recording. The research instrument used to collect information from the respondents is presented in Appendix 3.

The Choice Framework was employed for this study as the theoretical lens. According to this theory structures shapes individual agency vice versa. The CF notes that agency can only be realised with given structured and the interaction between agency and these structures. According to Giddens (1979; 1984), structures are directly linked to agency and would not exist without agency. The researcher believes that in order for CoJ residents to achieve the desired empowerment or development outcomes, individuals have to utilise their agency to navigate the structures around them. In the CF, there exist a double arrows systemic relationship between agency and structure that indicates that there is a

continuous interaction between agency and structures around them. In the CF; individuals' agency can with the resource portfolios at their disposal, helping an individual to negotiate a social structure in order to achieve, by means of their active choices.

In order to understand how agency and structures enable or hinder individual to realise the impact, demographic data like age, gender, education etc were also collected from the respondents to help with analysis the relationship that exists between agency and structure regarding free public WiFi hotspots.

4.9 Interview administration and data management

Face-to-face interviews were conducted for this study as it presents an opportunity for a higher response rate, given the trust that can be developed during physical interaction (Bowling, 2005). An assistant researcher was also appointed to assist during the data collection process. The researcher used two digital recording devices to collect data, this was to ensure that no response was missed if a mulfunction occurred on one of the recording devices. The researcher backed-up the data collected to a personal computer immediately after the interviews as well as storing the data to his Google Drive to ensure that any physical damage or theft doesn't stop progress of the research. The researcher also made hard copies of the field notes. All digital interviews were then transcribed. All interview and recording were date stamped and the location was included in the name of the file. Respondents' real names were not used to identify them, respondents were chronologically numbered (eg Respondent 1, Respondent 2, Respondent 3 etc.) to avoid compromising their identity.

4.10 Rigour in qualitative research

"Without rigour, research is worthless, its becomes a fiction, and loses its utility" (Morse, Barret, Mayan, Olson & Spiers, 2002:14). Qualitative research continues to be critiqued for lacking scholarly rigour despite its richness of the finding and the potential for discovery (Gioia, Corley & Hamilton, 2012). According to Bhattacherjee (2012:105), "Rigour in interpretive research is viewed in terms of systematic and transparent approaches for data collection and analysis rather than statistical benchmarks for construct validity or significance testing". Oxford College Dictionary (2007) defines rigour as "the quality of being extremely thorough, exhaustive, or accurate". Lincoln and Guba (1985) firstly addressed rigour in their model of trustworthiness of qualitative research. According to Morse *et al*. (2002) strategies like audit trail, coding, negative case analysis, categorising, structural corroboration, confirming results with participants and referential material adequacy can be used for demonstrating qualitative rigour. For the purpose of this study, the following were applied to ensure rigour of the study:

Credibility

According to Thomas and Magilvyv (2011), credibility is a strategy for demonstrating qualitative rigour that provides the research user to recognise the experiences contained within the study through the interpretation of participants' experiences. While in qualitative research this is referred to as credibility, in quantitative research it is referred to as internal validity. In order to achieve credibility, the researcher must check that the data is represented as a whole. Credibility of the study was achieved by ensuring that the researcher provides evidence of the engagement in the field (interview transcripts). The researcher also ensured that all respondents are recorded on a digital recorder and the recording were then transcribed and transcriptions were analysed. With this process in place, the data collection and analysis can be independently audited.

Transferability

This study ensured that transferability is achieved. Bhattacherjee (2012) defined transferability as the as the extent to which empirical results can be generalized to other settings. Transferability refers to the research findings from one study can be transferred to another group and be applicable to other contexts, subjects or participants. (Thomas & Magilvyv, 2011). Transferability is similar to external validity in qualitative research. To ensure that transferability of the study was achieved, research context was described in detail to ensure that research consumers are able to understand the extent to which the reported findings may be transferable to other settings. Another way the researcher achieved transferability was to provide a detailed description of the population under study by ensuring that the demographics and geographic boundaries were described in the study.

Dependability

According to Thomas and Magilvyv (2011), dependability is similar to reliability in quantitative research. It involves the application of audit trail strategies to ensure that another researcher can follow stipulated methodologies by the researcher to achieve similar or related results (Bhattacherjee, 2012). The following audit trail was followed as recommended by Thomas and Magilvyv (2011):

- The purpose of the study was described and was very specific.
- The researcher provided evidence on how and why the respondent of the study were selected.
- The researcher described how the data was collected and the duration of the data collection.
- The researcher explained how the data was reduced for analysis.
- The research findings were ethically presented and discussed.
- Techniques used to determine the credibility of the data were also clearly communicated.

Confirmability

The extent to which participants can independently confirm the empirical results of the study can be referred to as confirmability (Bhattacherjee, 2012). Confirmability is said to be similar to objectivity in quantitative research (Thomas & Magilvyv, 2011). Credibility, transferability, and dependability must be achieved first before confirmability can be established. To achieve confirmability the study must represent transparency on how the study was conducted and how the results were achieved. To achieve this, the researcher asked the respondents of the study to agree with the inferences derived by the researcher about a phenomenon of interest (based on a review of the research paper or report), then the findings can be viewed as confirmable.

The researcher ensured that credibility, transferability, dependability and confirmability was achieved to ensure rigour.

4.11 Validity and reliability of the study

According to Morse *et al*. (2002) there exist verification strategies that can be used to ensure that the study achieves reliability and validity. Verification strategies in a qualitative research are strategies that the researcher can use during the research process to ensure the study achieves reliability and validity which later contributes the rigour of the research (Morse *et al*., 2002). Morse *et al*. (2002) proposed five verification strategies that a researcher can use namely: methodological coherence, appropriate sampling, collecting and analysing data concurrently, thinking theoretically, and theory development. The five verification strategies proposed by Morse *et al*. (2002) were adopted to ensure that reliability and validity and overall rigour of the study was achieve. The five verification strategies adopted for this study are discussed below:

Methodological coherence

The first of the five verification strategies is methodological coherence. The aim of methodological coherence is to ensure that the research question and the methods section are coherent. In qualitative research, there is interdependence between question and the methods. The research questions must match the research methods employed which then must match the data collection and the data analysis procedures employed. The researcher ensured that the central research question and sub-research questions were directly aligned with the research methods, data analysis and the analysis procedure adopted for the study.

Appropriate sampling

The second strategy is ensuring that the sample of the study is appropriate. According to Morse *et al*. (2002), the respondents selected to participate in the study must have knowledge of the topic under study and must represent the characteristics of the desired sample. The researcher ensured that all selected respondents who participate in the study had knowledge of the topic under study and all had the desire characteristics. The researcher looked for negative cases to help him indicate aspects of the developing analysis that are initially less than obvious. The researcher ensured that relevant sampling techniques were used to help the researcher to select participants who will provide sufficient information to address the research problem and questions under study. Non-probability purposive sampling was then used in this study to ensure that the research identifies respondents with the desired characteristics. This sampling method is usually employed when the researcher is working with a small sample and the researcher wishes to select cases that are particularly informative (Saunders *et al.,* 2009).

Collecting and analysing data concurrently

The third verification strategy is data analysis. Data collection and analysis can happen at the same time, this enabled the researcher to identify an adjustment required to the research instrument as well as identify themes as the data was collected. While overlapping data collection and analysis to uncover themes on what is known and what the researcher still needs to probe on was also employed. According to Morse *et al*. (2002), the iterative interaction between data collection and data analysis is important in ensuring that the study achieves reliability and validity. To achieve validity and reliability for this study, the researcher followed an overlapping data collection and data analysis process. This verification strategy enabled the researcher modify data collection and analysis processes in order to achieve the research objective. Overlapping data collection and data analysis process also enabled the researcher to identify when enough data for the purpose of the study had been collected. Lastly, this allowed the researcher to identify and adjustment required to the research process to ensure that reliability and validity of the study is not compromised and the rigour is achieved.

Thinking theoretically

The fourth verification strategy is thinking theoretically. Thinking theoretical means that the researcher must have a theoretical lens to ensure that the research methods applied in the study are aligned to the theory or model adapted (Morse *et al*., 2002). Theoretical lens adapted for this study is Kleine's (2010) Choice Framework. The CF was used by the researcher to underpin the study and to help the researcher to think theoretically throughout the study.

Theory development

According to Morse *et al*. (2002), the researcher should develop a theory based on the research processes followed. All the other four verification strategies contribute in theory development and

together helps to ensure that rigour, validity and reliability in the current research study are achieved. The current study uncovered additional theoretical concepts that were not initially included in the framework. However, the purpose of this study was to test if the concepts Kleine's (2010) Choice Framework were applicable in the South African context and not to build a theory.

4.12 Axiological assumptions

The term 'axiology' has Greek roots, it combine two word *axios* and *logos* (Biedenbach & Jacobsson, 2016). "Axiology is a branch of philosophy that studies judgements about value" (Saunders *et al*., 2009:116). Axiological assumptions are mainly concerned with values and ethics applied in a social enquiry (Saunders *et al*., 2009). According to Biedenbach and Jacobsson (2016), the terms 'axiology' focuses on evaluating the nature of conduct (right or wrong), essence of goodness, obligation and value. Axiology focuses on understanding what is considered to be good, bad or desirable base on the individual and society as well as values (Biedenbach & Jacobsson, 2016). According to Saunders *et al*. (2009), it is important for a researcher to consider issues related to axiology when conducting research, as what the researcher consider to be good or bad and their values contributes to the research process and enables the researcher to achieve credible research results. Values guide human action and the way people reason (Heron,1996). Researchers have to be able to demonstrate axiological skill in all research processes by clearly articulating how their values guided their judgements and how this influenced the research findings. Researchers have to be mindful of values as they have an influence on the knowledge creation process (Biedenbach & Jacobsson, 2016).
The following set of ethical consideration followed during the study:

Given the nature of the study, it is important to include ethical consideration. Ethics clearance was obtained from the relevant ethics review committee at the University of the Witwatersrand, Johannesburg permitting me to conduct the study (See Appendix 1) for the ethics certificate. Saunders *et al*. (2009:184) defined ethics as the "norms or standards of behaviour that guide moral choices about our behaviour and our relationships with others".

- Ethical approval was obtained from the City of Johannesburg library services, (see Appendix 5) for the formal signed written letter from the City of Johannesburg executives stating their approval for Mr Hlelo Chauke to conduct research.
- Only participants over the age of eighteen were included in the study
- The issue of Plagiarism was taken into consideration, all sources that made part of the study were acknowledged and a full reference list is provided at the end of the study.
- The study ensured voluntary participation and harmlessness. According to Bhattacherjee (2012) and Saunders *et al.* (2009) research subject or participant must be aware that the study they are

participating in is voluntary and they can decide whether to continue or not freely without putting the respondent on a disadvantage if the respondent decides to withdraw from the research.

- The researcher provided each respondent with letter of consent (see Appendix 2) informing participants about the purpose of the study. According to Bhattacherjee (2012) informed consent gives the subject more information on their right to either participate or not participate in the study.
- The study also promised anonymity and confidentiality in the letter of consent (see Appendix 2). According to Bhattacherjee (2012) anonymity and confidentiality is primarily concerned with the protection of the respondent's identity, their personal interests, and future well-being.
- The study also provided respondent with disclosure. According to Bhattacherjee (2012), it is the researcher's obligation to provide research respondents/subject with some background information about their study before data is collected, this will help the respondent to decide whether or not they wish to participate in the study.
- The last ethical principle is analysis and reporting. The study followed the ethical obligations to show how the data was collected, analysed and reported in their study. Analysis and reporting is important as it specifies that all the findings will be disclosed even when they are negative or not what the researcher expected to be.

To achieve the ethical consideration stated above, the study followed absolutism theory to guide and inform the research's ethical decisions. According to Kelsen (1948), absolutism is the assumption that there exist an absolute truth and absolute values. This ethical theory assumes that the set of ethical principle does not changes and should always be adhered to regardless of the situation or pressures that maybe be presented to the researcher.

4.13 Limitations

The first limitation for this study was the time frame of the study, the time frame of the study can be a snapshot or multiple snapshots over a period of time. For the purpose of this study, a cross-sectional study was more appropriate as the researcher had one year to complete the study. This created a limitation because the researcher only investigated the impact over a period of one year. Time played a role in the number of respondents the researcher could contacted, resulting in a sample of 12 respondents.

The researcher used a purposive sampling strategy to identify the sample appropriate for the study. Purposive sampling assisted the researcher to obtain detailed insights from knowledgeable participants,

however, it did not enable the researcher to generalise the finding of the study (Bryman *et al.*, 2014). According to Saunders *et al*. (2009), the results cannot be considered to be statistically representative of the total population, however, it is only for the context under study and usually select a small sample. According to Bhattacherjee (2012), the interpretive paradigm's main purpose is not predicting the future or generalisation of the findings, but rather to help the researcher to understand meanings that are socially constructed. The aim of the study was not to generalise the results but to understand the meaning for the selected context.

The last limitation that the researcher experienced was the lack of literature on impact of ICT4D in the context of South Africa, this limited examining the existing body of knowledge. This also created a limitation as the researcher had limited reference point in the context of South Africa.

4.14 Chapter conclusion

Chapter four presented the ontological assumptions that inform the epistemological assumptions that make up the research paradigm. The research methods employed on the study have been discussed. This study followed the interpretive paradigm and employed qualitative methods. The chapter presented an argument about rigour in qualitative research and illustrated how verification strategies that ensure reliability and validity were built into the research methods to ensure overall rigour. The chapter lastly present information related to the axiological assumptions and limitation for the study.

Table 7:Chapter Four summary

Research Methodology	**Methodology Applied**
Philosophical paradigm	Interpretive
Research approach	Qualitative
Time horizon	Cross-sectional study
Data collection	Semi-structured interview
Data analysis	Thematic Analysis
Rigour in interpretive research	Thomas and Magilvyv (2011) strategies adopted to ensure rigour of the study
Validity and reliability in interpretive research	Morse *et al*. (2002) verification strategies were adopted

Chapter 5: Analytical Procedure

5.1 Introduction to Chapter 5

Chapter 5 introduces the analytical procedures that the researcher applied in data collection and analysis. This chapter explains in detail the procedures followed to address the research objectives. Various qualitative data analysis techniques are briefly discussed and the subsequent data analysis technique selected is discussed. Further detail on the justification of why the techniques were selected is presented in Chapter 5.

5.2 Sampling

Non-probability sampling was selected as the suitable sampling strategy where purposive sampling was used to identify respondents in the CoJ of Johannesburg with the desired characteristics for the inquiry. The researcher had a predetermined criterion that the respondent had to meet before they could be selected. Respondents had to be over the age of 18 years old, were using the CoJ free public WiFis, in a good health state (mentally and physically) and were willing to participate in the study. For the purpose of the study, fourteen respondents were initially proposed as suitable respondents for the study. The respondents were selected from four CoJ regions (region D, E, F and G). The researcher interviewed twelve of the initially proposed respondents.

5.3 Data collection

The requisite data was collected using semi-structured interviews. The researcher collected data from respondents through semi-structured, face-to-face interviews from the respondents identified through purposive sampling. The interviews were conducted in October 2018. A total of twelve interviews were conducted using open-ended questions in four CoJ regions. The researcher used an interview guide (see Appendix 4) to ensure that the questions posed to each participant are aligned with the research objective and the theoretical lens adopted for the study. The interview guide was developed based on the research objectives and the Choice Framework to ensure that emergent results can be easily assigned to relevant objectives and themes.

The semi-structured interviews enabled the researcher to gather detailed insights from the respondents as the researcher was able to probe with more questions to elicit detailed insights. The data was collected from twelve respondents. Sample characteristics where insights were gathered is presented in Table 8 below.

A participant information letter (see Appendix 2) containing information about the research title, purpose and aim of the research that the interview questions looked to address was handed out. Data

collection and analysis were done concurrently. After completion of the interviews from each location, interviews were later transcribed and notes collected from the field were updated and matched with the recordings. According to Saunders *et al*. (2009), in a qualitative study, analysis occurs during data collection data as well as after the collection. Collecting data and analysing the data concurrently enabled the researcher to recognise emergent patterns, themes, and the relationships among themes during the data collection process. The researcher reread all data collected and transcribed it before continuing to the next interview or analysing, this ensured that initial themes were developed for further analysis. Fereday and Muir-Cochrane (2006) argues that data collection and analysis process in a qualitative study needs to be an iterative and a reflexive process despite it being presented as a linear, step-by-step procedure. Fereday and Muir-Cochrane (2006) further notes that the interactive process is applied as the comprehensive principle of "goodness".

The audio file was transcribed and both files were backed up to a Google Drive. Concurrent collection and analysis allowed the researcher to improve the interview strategy and techniques for the next interview. According to Saunders *et al.* (2009), concurrent data collection and analysis, helps the researcher to shape the direction of data collection, this study is by design more inductive with a grounded approach.

Table 8: Respondents' Profile

Location	Region	Location	Participant	Gender	Age Range	Respondent Description
Johannesburg South	Region G	Lenasia Public Library	Respondent 1	Male	>35 years	Part-time College Student
			Respondent 2	Male	18 - 34	University Student (3rd Year)
		Lenasia Community Centre	Respondent 3	Male	18 - 34	College Student
			Respondent 4	Male	18 - 34	University Student
Soweto	Region D	Orlando East Public Library	Respondent 5	Male	18 - 34	University Graduate (unemployed)
			Respondent 6	Female	18 - 34	University Graduate (unemployed)
		Orlando East Community Centre	Respondent 7	Male	18 - 34	University Student
			Respondent 8	Male	18 - 34	College Student
Sandton	Region E	Sandton Library	Respondent 9	Female	>35 years	Part-time University Student (Employed)
			Respondent 10	Male	18 - 34	University Student
Johannesburg	Region F	Joburg Library	Respondent 11	Male	>35 years	Unemployed
			Respondent 12	Female	18 - 34	College Student

5.4 Data analysis procedure

This study adopted a qualitative approach to collect data. According to Saunders *et al.* (2009), qualitative data refers to all non-numeric data. Qualitative data is analysed differently to quantitative data analysis. Qualitative data analysis is specifically designed for qualitative research approaches to pursue the process of analysing data. According to Grbich (2012), qualitative data analysis consists of iterative processes and procedures that helps the researcher to move qualitative data into insights that help to generate understanding, explanation or interpretation of the situations under investigation. There exist various qualitative data analysis procedures, namely but not limited to: content analysis, narrative analysis, discourse analysis and grounded theory. These qualitative data analysis procedures are briefly discussed below.

- **Content analysis**

According to Elo and Kyngäs (2008), content analysis can be described as a method of analysing verbal, visual communication or written contents. Content analysis was first introduced in the 19th century to analyse newspaper and magazine articles, hymns, political speeches and advertisements. Content analysis is often referred to as a technique of analysing documents (Elo and Kyngäs, 2008)

- **Discourse analysis**

According to Ditsela (2017), discourse analysis is mainly concerned with analysing conversation (spoken interaction) and various types of written texts. The analysis techniques focus on verbally expression of people in their everyday social life.

- **Grounded theory**

According to Bhatachejee (2012), grounded theory is a qualitative analysis approach that is often used to inductively build theories about that phenomenon based on the results of the observed patterns of events or behaviours. Grounded theory is "heavily dependent on the observational and interpretive abilities of the researcher, and the resulting theory may be subjective and non-confirmable" Bhatachejee (2012:29). In grounded theory, there are three coding techniques for analysing collected data, namely: open, axial, and selective coding.

- **Narrative analysis**

Narrative analysis is mainly concerned with interpreting and understanding meaning in interview talk and connecting the dots from the transcribed experiences (Wiles, Rosenberg & Kearns, 2004). Narrative analysis is used to interpret conversations or story with an aim on understanding the meanings presented social setting in a given context (Wiles *et al*., 2004). According to Riessman (2005), several models of narrative analysis exist, namely: structural analysis, thematic analysis, performative analysis and interactional analysis.

This qualitative study adopted narrative analysis where thematic analysis was applied to analyse qualitative data collected. According to Braun and Clarke (2006) qualitative data analysis approaches are diverse, complex and nuanced, however, thematic analysis can be regarded as the basic qualitative data analysis method. Braun and Clarke (2006) recommend that the first qualitative data analysis technique a novice researcher should learn is thematic analysis. The below section briefly discusses thematic analysis applied in the study.

Thematic Analysis

According to Fereday and Muir-Cochrane (2006) thematic analysis aims to identify themes that emerge from an analysis that is then used to describe phenomenon. Braun and Clarke (2006) defined thematic analysis is a data analysis techniques that is used to identify, analyse and present the themes from the data collected. This technique allows the researcher to minimally organise and describes the data in detail. The patterns and themes are identified through carefully reading and re-reading the data, the emergent themes are carefully categorised for analysis.

Thematic data analysis allowed the researcher to analyse the data using a predefined six iterative phases. The study was divided into six phases, namely: familiarising yourself with your data, generating initial codes, searching for themes, reviewing themes, defining and naming themes and lastly producing the report.

Phase 1: Familiarising yourself with your data

During this stage of data analysis, the researcher transcribed digital audio recording into textual copy transcripts. During this stage, the researcher familiarised himself with the data by listening to each recording and transcribing the data into text documents. Initial themes were drawn up during this phase. According to Bhattacherjee (2012), data analysis may follow or overlap with data collection. Overlapping data collection and analysis has the advantage of adjusting the data collection process based on themes emerging from data analysis, or to further probe into these themes. The researcher collected the data and transcribed the data to allow easy identification of initial themes from the data collected.

Phase 2: Generating initial codes

According to Boyatzis (1998), the process of coding involved recognising an important moment and encoding it prior to a process of interpretation. The results can be coded using techniques such as open coding, closed coding, and selective coding. For the purposed of this analysis, closed coding was used. According to Wilder Research (2011), in closed coding, codes are pre-determined based on theories or hypotheses that the researcher has adopted as a theoretical lens. Codes were developed based on Kleine's (2010) Choice Framework (CF) that was selected as

a theoretical lens. Every interview was transcribed and the transcripts were re-read and coded based on the CF before the researcher moved to the next interview. The interviews collected were based on the categories identified in CF theoretical framework. The data collection and analysis was an iterative process, this helped the researcher to move qualitative data into insights that helps to generate understanding, explanation or interpretation of the situations under investigation as the data was being collected.

Phase 3: Searching for themes

Boyatzis (1998:161) defined a theme as "a pattern in the information that at minimum describes and organises the possible observations and at maximum interprets aspects of the phenomenon". The researcher then started to search for concepts in the transcripts. Concepts were examined to identify themes. Kleine's (2010) Choice Framework (CF) theoretical framework helped to guide the researcher to group the concepts and themes based on the construct of the framework. These identified themes based on the theoretical framework helped the researcher in understanding the phenomenon under investigation and answering the research question. As per Kleine's (2010) Choice Framework (CF), all the themes were then linked to four CF construct namely: dimension of choice, agency, structures and development outcome.

Phase 4: Reviewing themes

During this phase, the themes that were generated in phase three were reviewed. The themes were reviewed based on the codes that the researcher generated. Aligning the themes and the codes enabled the researcher to establish coherence between the two. The themes were then reviewed to ensure that they are aligned with the Choice Framework. This allowed the researcher to establish an accurate representation of the data through the theoretical lens adapted to investigate the phenomenon. As per Kleine's (2010) Choice Framework (CF), there exists a relationship between the four CF construct namely: dimension of choice, agency, structures and development outcome. This stage of the analysis examined the relationship that exist among the concepts grouped into the four CF constructs and reviewed how each theme aligns to the CF. This phase also identified potential causal relationships that might exists between the themes and how each dimension relates to the next one.

Phase 5: Defining and naming themes

This stage of thematic analysis process focusing on clearly defining and naming themes reviewed in phase four. This phase produced a full set of worked-out themes. The themes were based on the objectives of the enquiry. The themes were also aligned to the theoretical framework to allow easy analysis and grouping.

Phase 6: Producing the report

The final phase of thematic analysis entailed producing the final analysis developed from the previous phases. After producing the results, the researcher started writing up of the report based on the outcome of the previous phases of analysis.

5.5 Chapter conclusion

Chapter 5 introduced the analytical procedures that the researcher applied in data collection and analysis. This chapter explained in detail the procedures followed to address the research objectives. Various qualitative data analysis techniques were briefly discussed and the subsequent data analysis technique selected is discussed and the justification of why the techniques was selected is presented.

Chapter 6: Results, Findings and Discussions

6.1 Introduction to Chapter 6

The previous chapter explained the analytical procedures that were applied when the researcher collected data as well as how the data collected was analysed. Chapter 6 discusses the findings of the study in the light of the literature reviewed and the additional literature sourced. Chapter six presents the results and findings of the study. This chapter categorised the results into themes derived from the research objective and theoretical framework adopted to help the researcher address the main research question *"**How does the use of free public WiFi hotspots impact development of City of Johannesburg residents, as perceived by the residents?**"*. This chapter is fundamental to this enquiry, as it presents empirical results to address the research objectives of the study that have been discussed in Chapter 1. The objectives were grouped into themes. The research objectives were:

- **Objective 1:** To understand who uses the free public WiFi hotspots.
- **Objective 2:** To understand what the CoJ residents use these free public WiFi hotspots for.
- **Objective 3:** To understand whether free public WiFi hotspots has impacted on the development of CoJ resident and how, if any impact was experienced.

Each theme is discussed and incorporated to the theoretical lens adopted. Literature is then sourced to compare the literature with the findings derived from the interviews analysed in Chapter Six. The chapter first reports detailed descriptions of the responses and later introduces the findings gathered from the respondents

6.2 Response rate

Data for this study was collected through semi-structured interviews in the identified CoJ regions. The initial sample size identified for the study was a predetermined 14 respondents hailing from seven locations with WiFi hotspots in four City of Johannesburg regions. Of the 14 initially identified sample size, the researcher managed to interview 12 respondents from six locations, achieving 86% response rate. Two respondents from the initially identified Maboneng prescient in CoJ region F were not interviewed as the WiFi was no longer working and there were no people who were using the WiFi at the time. The study only interviewed people who were using the WiFi on the day data was collected. The 12 respondents that the researcher managed to get hold of answered all the interview questions in full. This can be attributed to the fact that semi-structured interviews allowed the researcher to build enough trust for respondents to have a conversation that is led by both participants and not a formal interview. The researcher was also able to rephrase and clarify any unclear questions for the respondents immediately, allowing the respondents to answer specific questions. The approach that the researcher

took of making respondents feel comfortable and providing the respondents with a letter of consent contributed significantly to the response rate.

6.3 Sample characteristics

6.3.1 Age of respondents

As proposed in the research proposal, all respondents selected to participate in this study were over the age of 18 years. According to the South African Government (2010) Births and Deaths Registration Amendment Bill 18D of 2010 a "person of age" means any person who has attained the age of 18 years or older. According to this bill persons under the age of 18 are considered legal minors who have limited legal capacity to act independently without the assistance of an adult. The proposed age of respondents' criterion was met by 100% of the respondents as proposed.

6.3.2 Gender

Of the twelve respondents who participated in the study, the majority were male respondents which accounted to nine while three were female respondents. Most of the potential female participants were not willing to take part in the study. Only respondents who consented could participate in the study.

6.3.3 Ethnicity

All respondents who participated in the study were of African ethnicity. The reason for this was due to the fact that the free public WiFi hotspots is a service that is specifically targeted to poorer people who currently have limited access to internet connectivity due to limited alternatives to access the cyberspace. This was evident at the locations as the majority, if not all users found in the identified locations were of African ethnicity. Majority of people living in poorer conditions in South Africa are of African ethnicity, this may have influenced ethnic presence in these locations on the day of the data collection.

6.4 Research Question 1: Who Are the Users?

Objective 1: To understand who uses the free public WiFi hotspots.

Theoretical Lens Concept: agency and structures

6.4.1 Agency

The results suggest that individual agency impacts the resources portfolio and the development outcomes of the user. Sen (1985:203) defined agency as "what a person is free to do and achieve in pursuit of whatever goals or values he or she regards as important". According to Ratan and Bailur (2007:120), agency is concerned with "the ability to participate in deciding matters that bear on that good". It is therefore important to understand who are the users as their personal characteristics impact the resource portfolio and development that they are or are not able to achieve. This is important for

this interpretive qualitative study as the researcher is aware that agency is socially constructed based on the social context. This supports Kleine's (2010:111) argument that "personal characteristics of an individual which may in a given social context become related to socially constructed axes of exclusion and influence the scope and scale of the resource portfolio". Kipo (2014) argues that agency of the individual can differ based on social position that an individual occupies in a social setting. Kipo (2014) continues to note that some individuals have more influence over others which then impacts the resource portfolio that they have access to. Kipo (2014) supports Kleine's (2010) argument on personal characteristics by noting that wealth, ethnicity, class, social prestige, gender, sexual preference, education or occupation can influence occupancy of different social positions. Agency does not mean equal power or influence; some have more transformative action (power) than others. In order for this inquiry to understand the development outcomes, the researcher had to firstly understand who the users were to better understand their agency and how their agency impacts the users' resource portfolio. The personal characteristics that the researcher investigated were age, gender and ethnicity as in a South African context these are key indicators of inequalities to resource portfolios.

Age

Age is one of the factors that reflected personal characteristics as identified by Kleine (2010). According to Kleine (2010), age influences the resource portfolio available to the user to choose from in order to achieve desired development outcome. To get a sense on the age of the people who use the identified WiFi hotspots, the researcher posed the question: *What kind of people usually frequent this place?*

The respondents indicated that different age groups frequent the WiFi hotspots. However, there was great emphasis on student-age group being frequent users. The respondents indicated that by students they were referring to primary school, high school, college and university students, basically from teenagers to people in their thirties. The results show that there is strong dominance of student-age users, this shows that the users who chose to use these WiFi hotspots are mostly studying towards something formally or informally.

Respondent 6: *"It is mostly students, varsity students. Because especially when you are coming around August, you will find your professionals, your student Attorney coming here to study for their board exams. Mostly it is packed around that time. When coming to final exams, it is packed!!..packed!!. You even have to wait outside for people to finish so that you can go in."*

Respondent 7: *"It is our age group…I can say it is teenagers to the 30 year olds average."*

Respondent 8: *"Most of the time it is students. Some school kids as well. When I say students, I am referring to tertiary wise so…."*

Respondent 9: *"It is usually student from what I can see. It is different age groups." […] "I think it is both, because I sometimes see schools kids in school uniform….but sometimes I see people…much like myself, adults. It is people who are studying part time."*

Some respondents indicated that the age group that frequent the hotspots is seasonal and it fluctuates based on the time of the day, month and year. These respondents said:

Respondent 3: *"Most of the time it is school kids. When they come out of school, they come over here to study. And then after studying, they will stand here for few minutes and will start updating their WhatsApp, download music and stuff,,,,"*
Respondent 5*: "it also depends on the public school holidays. Since they (school kids) are closed, a lot of them get bored at home and come here. That is my philosophy."*
Respondent 9: "*Especially when you come on a Saturday, it is usually like older…not older but like mature people if I can put it that way."*

The responses suggest that there are no age restrictions on who can use these free public WiFi hotspots, however it is a choice that an individual has to make to decide whether or not to use them.

Respondent 4: *"I don't think there is any restrictions. Anyone can just come."*
Respondent 8: *"No there are no restrictions, anyone can just come. Form kids to elderly people."*

The results show that age and economic activities of an individual are closely related to the financial resources of an individual. The results show that student-age users are more likely to use free WiFi given their financial standing. The student-age are group that is internet savvy and are keen to use the Internet, however, the financial resource is a limitation as they cannot afford to buy prepaid broadband data to access the Internet from the comfort of their home on their devices of choice. The student-age group is also most likely to be unemployed. Employed people are less likely to use these WiFi hotspots as the working hours are also the same as the South African labour/working hours.

Gender

From the interviews, there was little emphasis on gender. Only two respondents touched on the issue of gender. Kleine (2010) highlighted gender is part of the personal characteristics that influences individual agency. However, from the empirical results, there was little emphasis on how gender impacts the individual agency and resource portfolio available to an individual. The respondents seemed to suggest that all people are presented with equal opportunity regardless of gender to do and choose the life they value or regard as important.

Respondent 1: *"Anyone can just come, connect to the WiFi and write some other information down. And you will see the man is going out. Even the old ladies do come here.".*
Respondent 7: *"All gender do come here."*

These views however might have to do with the fact that few women were among the participants, so the views of women were not fully captured in the data. From the researcher's observation during the interview process, there were fewer women present in the locations during the interviews. The women who were present seemed to be very busy and were not willing to be disturbed when asked to participate. The men were noticeably the majority at all the locations that the researcher went to for data collection and they were more willing to participate in the study.

Ethnicity

The last personal characteristics that the researcher focused on was ethnicity. Given the WiFi hotspots that the researcher selected, all respondents were African. The respondents also didn't pay too much attention to ethnicity when asked about frequent users of the WiFi hotspots. Only one respondent found in Lenasia highlighted ethnicity.

Respondent 1: *"Indians….every nations do come here. Everyone is welcome here".*

In the Choice Framework age, gender and ethnicity influences the scope and scale of the resource portfolio. These personal characteristics also influence an individual's resource portfolio. According to Kleine (2010), the portfolio comprises ten types of resources. The resource portfolio consists of: material, financial, natural, geographical, human, educational, psychological, information, cultural and social resources. Individual agency is measured by an individual's endowment of these resources. The resource endowment of the respondents and the CoJ residents' personal characteristics influenced their resource portfolio endowment.

Geographical resources

According to Kleine (2010), geographical resources focus on the implications of relative distances and locations. To get a sense of respondents geographical resources, the researcher posed the question: *Where do you stay*? and *is the WiFi conveniently located?*. The results showed that geographical location limited some of the individual's resource-based agency. This supports Shaheen's (2011) argument that the location of ICT facilities and geographical locations constitute another important barrier to access.

Respondent 1: "*I stay in an informal settlement called Pricust." […] "Before Thembalihle. It is just nearby, but not so close" […] "I just walk to get here and to go home" […] "mmmhhh!...45 minutes to*

50 minutes" […] "I think if they can expand the WiFi, it will be good. Even in townships, it must also be available in townships. Because other people or students cannot come to the library because it is far or they will have to take a taxi to get here. Some people are also not familiar with reading books or going to the library, so they must also be available to people who don't go to libraries, like in malls. If they can organise something like this in malls it can help to extend the WiFi."

Respondent 5: *"Yes I stay around here, but on the other end. Closer to….closer to Noorgesig." […] "Well….considering the fact that there is only one library for the whole of Orlando (Orlando East). I would say yes and no because I am at the far end of Orlando, so I have to walk for 30 to 35 minutes to get here. So there is no other way, it is the only library, it is the only centre that can offer that service." […] "I just walk. It is a bit of a walk to get here. It takes me 30 to 35 minutes to get here."*

Respondent 6: *"I stay in Pimville, there is no WiFi connectivity there. So I have to come here." […] "Sometimes I walk, sometimes I use Rea Vaya and sometimes I take a taxi. So since I said like when you are not employed and you don't have money, you will have to walk. It is like 6 to 7 kilometres to get here." […] "It is not nice, it is not nice. Like you have to do what you have to do for your own life. Like I said it is dangerous here and criminals. Anything can happen." […] "I would say, WiFi is a very good idea, but I would say they don't need to put it here only in Orlando, also in other locations like Pimville. Also to have security, the place need to be safe because sometime you need to check your emails and it is late. Sometimes you get a phone call that: "we are calling you for an interview and we will send you an email". Because we are not working, I will have to go check through the WiFi, but if we don't have WiFi in Pimville, it is sad to walk almost 14 kilometres just to check your emails."*

Respondent 11: "*I stay in Hillbrow" […] "I just walk…because before the WiFi, I have been using the City library for a long time." […] "There is a library in Yeoville. Yeoville library is too small. but I am not sure about the WiFi. But since I told you, I have been coming here for a long time because it is convenient, everything I need is here."*

Respondent 12: *" I stay in Dobsonville" […] "There is WiFi also in Donsonville …There is. The thing is that the WiFi is not inside, so it is outside. So that is a problem." […]."it is not inside the library. When you are inside it doesn't connect. You see this inequality of resource, because of the location. You see we are in Soweto, so they don't care. If you are in Johannesburg, obviously people will need and there are a lot of people coming in and out from different places. So in Soweto, they assume it is Soweto people only. So they are like, even if it can be outside. And they also don't even allow…so it is a community centre and there is a library inside the community centre. So we only use that space…but then when you are outside the gate of that library, you are not allowed. You have to use it outside the community centre…bruh! Tell me about it….."*

The results show that based on the individual age and sex, the geographical resource can play as an enabler or a hindrance to the individual resource portfolio that will enable the user to achieve the development that they value. The results also show that most of the users stay far from the WiFi hotspots

and they have to walk substantial distances to get to the locations where these hotspots are situated. The results show that it is not about the convenience of the location. The locations are quite inconvenient, however the need and the lack of alternatives to access the Internet drives people to walk long distances to get to and use these WiFi hotspots. The lack of alternatives is based on the fact that the majority of the users are student-age group who in most cases are from disadvantaged families and currently do not have any source of income given their age and economic circumstances. What respondents considered inconvenient differed depending on the importance of what they were trying to access. The results suggest that a user who had to respond to an email from recruiters was more prepared to walk longer distance as compare to a user who was trying to access social media. The results also show that people are prepared to walk long distances, to get access to what in the information age is considered to be a basic human right like clean water; internet connectivity is that important to people.

Material resources

According to Kleine (2010), material resources encompasses material objects such as computer hardware that are required in the production process. The results show that the material resources at the user's disposal determines the choices and the development outcomes a user can achieve. Material resource of the users can be an enabler or a hindrance to the choices the user is able to achieve. To get a sense of respondents' material resources, the researcher posed the question: *What do you need to connect to this WiFi hotspot?* and *what device do you use to connect to the WiFi hotspot?*.

Respondent 1: *"This is the type of device I am use (showing me his Huawei smartphone). Sometimes it can't connect to everything that I might need, because it will sometime say that the memory is full." […] "Yes, it is a smaller smartphone" […] "Yes, I only use the phone to connect."…."I only use my phone as I don't have better devices than this phone. I don't have a laptop or a tablet." […] "I would have preferred a laptop. Because the trading business is so wide, and some stuff I will need to connect to them. Maybe like learning, like when they send me seminars or webinars, I will need a bigger screen to open those videos. So, I would have preferred to have a laptop."*

Respondent 1 indicated that while he was able to connect to the WiFi, there were other things that he is not able to achieve given the material resource constrains. While Respondent 1 indicated the limitations he experiences, some respondents had choices in terms of the material resources that they can choose from to achieve the life that they value and desire. The results support Kipo's (2014) argument that agency of individuals can differ based on the social position that an individual occupies and that some individuals have more influence than others which then impacts the resource portfolio that they have access to. The results show that Respondent 1, given his economic status as an unemployed middle-aged man, he was not able to accumulate some resources like a laptop that would give him enough choices to achieve the life that he values and wishes for.

Respondent 5: **"***To connect to the WiFi you use your handheld device or your laptop." […] "Well, I am always using my…..well I interchange actually, its* either I bring my laptop or I just bring my *phone." […] "I prefer my phone." […] "Because it is portable more than carrying the laptop in a bag on my back."*

Respondent 7: **"***use my phone and PlayStation Vita and their computers." […] "I prefer my PlayStation vita." […] "It is faster than my phone."*

Respondent 8: *"I use my phone, sometime my laptop. At times I also use their own computers."*

Respondent 9: *"I use this (Pointing at a smaller laptop)….It is a netbook. Most of the time, I bring my own." […] "Yes, this is what I use. I don't use my phone much for that." […] "it is bigger, unlike a cellphone. If I have to read a document on a cellphone it will take me forever…if it is on a bigger screen it is easy to read through."*

Respondent 10: *"I use my cellphone" […] "I do have a laptop that I could use, I just don't come with it."*

The results also show that while some have managed to accumulate the material resources that allows them to achieve the life they value, they are limited by other aspects of the resource portfolio. Respondent 5 indicated that while he has a laptop, he doesn't carry it with him because of the geographical resources limitation. He prefers his phone because it is possible and he has to walk 30 to 35 minutes to get to the location. Respondent 6 also indicate that she has a laptop, however she doesn't carry it to the location because she has to walk long distances and it is also not safe.

Respondent 6: *"I use my cellphone." […] "Because of safety, I cannot carry my laptop for 7 kilometres. So I prefer my cellphone because it is portable." […] "I would use both (cellphone and laptop because the network…sometime it is very good, you can download your apps. If it wasn't due to theft and everything, the network is very much good"*

Educational resources

Klein (2010:111) operationalised educational resources as skills and education that an individual can acquire through means that are formal or informal. According to Hawkins (2002), a relevant education is more important and understanding how to use technology as a tool helps to increase productivity and creativity. Raiti (2007) further supports Hawkins (2002) by noting that the more educated an individual is, the better the individual's decision-making skills. To get a sense of the respondents' educational resource, the researcher posed the question: *How do you know how to use this WiFi hotspot?* And *Did you get trained on how to use this WiFi hotspot?.* The two questions allowed the researcher to get a sense of the respondent's educational resources.

The results support Raiti (2007) and Hawkins's (2002) argument on education, the results indicate that the more educated an individual user is, the more likely it is easier for them to navigate WiFi hotspot's settings to ensure that their desired outcomes are achieved. The more educated users were less likely to ask for assistance to connect their device to the WiFi hotspot.

Respondent 5: *"I don't know. I am an honours graduate. So you know when you are studying, you have to use computers."[…] "I was studying at UJ (University of Johannesburg)" […] "I was studying political science".*

Respondent 7: *"I am a computer science student."* […]*"I don't study at MIT, I am a student at UNISA."* […]*"Most of the time the thing that I work with are online. There is this thing that I am working on. It is called MIT OpenCourseWare from Massachusetts Institute of Technology. So the thing they do is that all their courses are posted online. Question papers, lecture notes and lecture slide. So for my modules like maths and computer science, I use material from MIT (Massachusetts Institute of Technology). The only way I can access them is through the Internet."*

Respondent 12: *"You see me and technology, we are friends." […] "I am studying public relations." […] "in Wescol College, in Randfontein. A local college, government college."*

Respondents 5, Respondent 7 and Respondent 12 indicated that their educational background enabled them to better navigate the WiFi hotspots.

Respondent 1: *"I am studying business management diploma at a college in Johannesburg."*

Respondent 9: *"I use it to like…Submit my assignment in my UNISA portal. I am studying long distance and I have a full-time job. So…it helps that there is free WiFi here because I don't have to stay at home because there is a lot of disturbance at home."*

The response from Respondent 9 supports Hawkins (2002) argument that education enhances the individual's decision-making skills. We can see Respondent 9 is now able to decide on what she allocates her time to and where she can go to achieve the development outcomes that she values.

Financial resources

According to Kleine (2010), financial resources include all forms of financial capital like savings, cash, dividends, shares etc. Financial resources also cover the ability of the individual to access credit facilities. According to Geerdts *et al*. (2016), while many innovations have amplified the inequality between the haves and the have-nots, many of these innovations require financial resources to exercise the rights to access these innovations. Geerdts *et al*. (2016) argues that the deployment of WiFi hotspots helps users to harness the economic benefits of broadband without excluding those marginalised from innovative services due to their financial status. The results support Geerdts's *et al*. (2016) argument by showing that the free public WiFi extends the financial resources available to the individuals, which then gives them access to other resources that they otherwise would not have been able to access without

internet connection. The results also show that most of the respondents do not have any other means of connecting to the Internet. Respondent 6 and Respondent 11 show that since they are not employed, connecting to the Internet has become a luxury as data is expensive and they have limited financial resources. Heeks and Kanashiro (2009) argue that for a user to achieve and deliver end results, in this case choices, action resources such as money and raw materials are needed to achieve desired results. The results support this argument by the responses from Respondent 6 and Respondent 11 that show that the dependency on money to access the Internet limited their ability to access the Internet as they were unemployed and have limited financial resources. The results suggest that this limitation has since changed since WiFi is provided to users at no cost.

Respondent 6: *"Mostly is because data is expensive, very much expensive. Most of us are unemployed and when you have to apply for jobs or check your email, you need to go to the WiFi. Basically, it is because of affordability of the data, since we cannot afford data, it is a good idea to come access the WiFi here." […] "So since I said I like when you are not employed and you don't have money, you will have to walk. It is like 6 to 7 kilometres to get here."*

Respondent 11: *"Because…people…especially we black people, we don't have money. So internet is expensive…buying data is expensive. I think the introduction of WiFi made it easier for people to get into the information. Whatever information that they want."*

The results also show that while users currently have limited financial resources, the free public WiFi extends the financial resources available to these individuals, giving them access to resources that they otherwise would not have likely applyed for jobs online in an attempt to change their current economic status and resource portfolio. This then also allows them to redirect their current financial resources to their other existing burning needs like taking a taxi. Getting a job would mean that users would now be able to get enough money. Respondent 1 indicated that his material resources did not include a laptop or a tablet. His geographical location was also inconvenient as he had to walk for almost 45 minutes. This indicated his limited financial resources which meant that if he didn't have access to free WiFi, he also would not be able to access the Internet as money is currently a limitation.

Respondent 1: *"I need to get money because I am not yet working and nobody is working at home. So….I come here to benefit from this WiFi as I don't have to pay anything."*

Social resources

According to Kleine (2010), social resources refer to the durable network and mutual acquaintance that an individual possesses. These resources can be in the form of friendship, shared ethnicity membership to a group, class, kinship or any other form of informal commonality ties. Social resources show how deeply intertwined individuals are and are quite important in realisation of goals. According to Bass *et*

al. (2013), the social resources have a potential to enable or inhibit users and potential users from the furtherance of their own lives to achieve the live they value by taking full advantage of ICT resources. The response from Respondent 7 supports Bass *et al*. (2013) argument that social resources can be an enabler or hindrance. Results show that with the help of his brother, Respondent 7 managed to gain awareness of the free public WiFi hotspot that is available to enable him to access MIT OpenCourseWare as a computer science student, enabling him to increase his educational resources. Bailur and Masiero (2012) argue that social resources are necessary social connectors, this is evident from Respondent 4 and Respondent 7, who used their existing relationship to gain awareness of the free public WiFi, allowing them to connect to the Internet and achieve the lives they value.

Respondent 7: *"I was told by my younger brother, he usually come here to download games."*
Respondent 4: *"I just came here one day, some of my friends told me that there is a library. So I just came here."*

Bass *et al*. (2013) further argues that social resources at an individual's disposal indirectly influences the ability to achieve results as well as the ability for an individual to actually achieve the desired outcomes. Sambasivan and Smyth (2010) adds that social resources are important as individuals in a social setting depend on each other to achieve desired outcomes like socializing, work, entertainment, education etc. This argument is supported by the findings from Respondent 12 who notes that the social setting found in these hotspots motivates her to study more and focus as compared to when she is at home where there are many disturbances. Access to these WiFi hotspots have a collective positive impact on users as highlighted by Respondent 12 that when the area is packed with people who are studying and focused, it positively influences her ability to focus and study. Social resources have a positive influence in enabling the freedom of users to achieve the life desired with the help of the social resources portfolio.

Respondent 12: *"I like it here, I love reading, I love literature…I love being here…this place makes me feel mmmmm!....its is a very nice place. There is motivation. People are serious here. Even if you have WiFi, and people are actually studying…even if they are not actually studying…you are like yohh!...people are focused here, so you are like, I should be focused too"*

The results from Respondent 12 above shows that while there may be limitations in geographical, material, financial or educational resources, the individual's social resources can help an individual to gain access to free Internet available at the WiFi hotspots in local centres. Geographical, material, financial or educational resource limitations can be overcome through the social resource portfolio an individual has access to. Respondent 1 indicated that while one of his friends had material resource limitations, he was able to overcome this based on the mutual relationship that he has with him and was

able to borrow a device to access the Internet. While the resource constraints give rise to use and access issues, social resources potentially shape the remedy process.

Respondent 1: *"Yes there are. There are friends who come here to use WiFi here. Even yesterday a friend of mine was here and he had left his phone, I borrowed him mine to access the Internet because the computers were not working."*

The results from the study also suggest that the people who frequent the WiFi hotspots are actually able to improve their social resources endowment by expanding their current network or friendship, mutual acquaintance etc. Respondent 1 indicated that by going to the WiFi hotspots he was able to get a fiancé, while Respondent 6 and Respondent 11 were able to make new acquaintance even though they could not regard them as friends.

Respondent 1: *"It benefited a lot…. It benefited a lot…. It benefited a lot…like….I now know alot of people that I didn't know before. The people of this library and other student." […] "Yes I have….there is this friend of mine, she is on duty now. she is a domestic worker. When she knocks off work, she comes here to connect." […] "She is now my fiancé.". ." […] " This library is so familiar to me…even people love this library, they know me. They even give me tea to drink. (laughing)"*
Respondent 6: *"I know mmm!…..most people I made friend. Actually, I cannot say they are my friend, it is just people I usually see. I know I will find them here or they will find me here." […] "I have met new people here"*
Respondent 11: *"I got friend who come here? […] "Jah…I met a lot of people through coming here before using the WiFi. The WiFi came in later. I have been using this place for a long time."*
Respondent 12: *"Mostly my friends, they come here as well."*

The responses suggest that social resources are robust and pervasive as they always find a way to overcome access and use constraints. The results also showed that social resources are important in enabling awareness on how to gain access ICT resources available for people to use. Social resources improves use of ICTs as a result of awareness raised by the social links that an individual has access to. The results also showed that there are many social benefits of going to the WiFi hotspots. Users were able to expand their social resources by making new friends, gaining access to material resources that they didn't have by borrowing from their friends, gaining inspiration etc.

Psychological resources

Kleine (2010) argues that psychological resources are among the vital aspects of individual agency. According to Kleine (2010), psychological resources includes psychological assets like optimism, creativity, self-confidence, resilience and tenacity. Attwood and May (2015) also add to the argument

by noting that psychological resources are important for individual's inner empowerment that can be used to increase the psychological resource portfolio which then plays a central role in the individual development and agency. The results support this argument by showing that CoJ residents improved their psychological resources as a result the use of the free public WiFi hotspots, aiding them in the process of building self-esteem and confidence.

Respondent 1: *"Yes, now I am confident. I just take my stuff from home and then come here. I know everything I am gonna do by myself" […] "It is not that I am confident. Even myself, I need to know some other corners, I am not yet finished with those corners of WiFi. Now I am able to connect, like to search some other information…."*
Respondent 2: *"I am not very confident, but I am average. I know how to use it." […] "ahhh!... no I can't teach anyone, it is only for my benefit."*
Respondent 3: *"Jah (yes) I am confident, because now it is easy simple to connect and the quality has improved." […] "Like I was using it a lot."*
Respondent 4: *"I am confident, I am able to even help others who need assistance." […] "Using it every day made me to be more comfortable. The more you use it, the more you understand."*

According to Attwood and May (2015), when individuals engage positively with the psychological resources by using the likes of creativity, cognitive skills or emotions, they are better at finding solutions to problems around ICT access, bypassing limitations and pursuing new ventures. The results show that Respondent 6 used her psychological resources which in this case includes willingness to ask questions and her curiosity to ask why people were gathering outside the library with their phones instead of being inside. She quickly learnt that there was free WiFi through her curiosity and willingness to ask questions. This then allowed her to understand the dimensions of choice available to her. She now has a choice to access the Internet based on her new knowledge of an alternative to costly fee-based access to the Internet.

Respondent 6: *"it is not complicated, actually it is very easy." […] "Started by when I saw a lot of people just seating around the library having their laptops and cellphones, then I asked what is happening there. Then they said there is actually WiFi. then months later I heard it on radio."*

We also see similar behaviour from Respondent 12, this respondent used her psychological resources (optimism) to avoiding being intimidated by technology, and embracing it instead. She notes that her and technology are friends, this shows her willingness to try out any technology related development and continue to learn by engaging with the technology.

Respondent 12: *"You see me and technology, we are friends."*

Kleine (2010) argues that psychological assets like spirituality or religious beliefs can strengthen or weaken an individual's psychological resources. The results show that respondent one uses the WiFI hotspots to strengthen his psychological resources by ensuring that he keeps his spirituality uplifted by watching pastors preach on YouTube. This shows that the WiFi hotspots also serve as a centre for enrichment of spiritual aspects, and as a result improving their psychological resource portfolio.

Respondent 1: *"I also use it to see overseas prophets. I am a Christian, so I also use this WiFi to see other preachers out there." […] "Yes, to uplift myself spiritually." […] "there are many videos on YouTube where the pastor I watch is preaching, as well as his funeral."*

Information resources

Kleine (2010) lists information as part of the key resource in the agency based resource portfolio. She further notes that the first step to knowledge acquisition is access to information. The results as indicated by Respondent 6 supports this argument by noting that lack of information is resulting in people not being aware of the free WiFi hotspots available. However, this respondent further argues that the first step to knowledge acquisition is willingness to look for this information and not transfer that responsibility to other people. The respondent further argues that people must take initiative and look for information in order to expand their information resource portfolio. Respondent 6's psychological resource (curiosity and willingness to ask questions) enabled her to expand and gain information on the free WiFi availability at her local library even though her geographical resources were not as convenient.

Respondent 6: "*mmm!...I would say it is lack of information. Basically it is only lack of information. And some people are just not willing to take the first step….because we don't have data or we don't have WiFi hotspot in Pimville, then I will just wait until I buy data. It is just about how eager are you to get the information, to get the opportunities. It is entirely up to us." […] "I just asked someone to show me first time, then the next time you just remember what they showed you."*

Respondent 6 shows that her psychological resources (curiosity) allowed her to improve her information resource as the Internet allowed her to access information that would allow achieving her chosen development outcome. The results also suggest that users with higher educational resources are more likely to find it easier to process information and to access or use the facilities that will enhance their resource portfolio. Respondent 6 indicated that she had a university degree and had been previously employed, meaning she had likely been exposed to WiFi technology. When she then asked why people were gathering around the library with their phone and they replied, "because there is WiFi", it was much easier for her to understand what they were talking about as there is an interplay between

resources in this case educational, psychological and information resources. The results lastly suggest that it is more likely for people who are already motivated to seek out information to gain access to these hotspots. The results suggest that it is people who already see the value of information, who are likely to source more information. Most of the respondents were student-age group, implying there was a natural curiousity to learn as the majority were in university, college or had previously been informally exposed to some level of education.

Health resources

Health is listed in Kleine's (2010) choice framework as one of the ten resources. According to Kleine (2010:111), "good health is a prerequisite for a person's ability to choose the life she or he values". In order to get a sense of the individual health resources, the researcher posed the question: *Do you think this WiFi hotspot is user friendly for people with any disabilities and why do you this so?* The responses show that individual state of health (ability or disability) were critical as they can enable or hinder the ability to reach these WiFi hotspot. The respondents interviewed were in such a state of health that could enabled them to easily reach the WiFi hotspots on foot or through other modes of transportation. The results suggested that potential users with disability had limited choices as to get to the locations. A user had to walk or use other modes of transport, potentially making it difficult for others with disabilities like blindness to read the instructions for WiFi access or even use the password needed for connecting.

Respondent 1: *"Those people….those people are somehow scarce for me to see them here….the disabled people. I don't know…..maybe there is something that needs to be done. They are so scarce in this library, I don't know about other libraries. But I don't usually see them." […] "maybe they don't know that they are welcome. Because there are people who are disabled who need to connect to the WiFi. Some are student."*

Respondent 3: *ahhh!...it depends on the type of disability. But I think there should be someone instructing, I don't think it is that user friendly for them.*

Respondent 4: *"No, it is not friendly for people with disabilities. It does not favour them. People with disabilities need special treatment, there is no special treatment as everyone is on their own. No one is assisting us here."*

Respondent 7: *"For someone who is blind, it is not friendly. But for other disabilities I think it is safe."*

Respondent 8: *"I've…..I've never…I've seen only….once or twice, someone came in with a wheelchair and they accommodate for such people."*

Respondent 9: *"I haven't seen anyone with a disability. So I might not be the right person to answer that one. But it should, because there is a lift and there is also a ramp. It should be."*

Respondent 12: *"They have to…but I can see the steps, they are not ….I am not sure….they have to fix those things." […] "It is kinda sad to think about it….I never thought about it. But then you know…everyone has to have access to information….so it is not right."*

The WiFi hotspots are not conveniently located for all users. As indicated in the geographical resource section, users indicated that they had to walk a substantial distance to get to a free WiFi hotspot, some indicated that they had to take some form of transportation. To access these locations, an individual must be in a health state that will allow them to get there. Respondent 6 indicated that it is not safe when outside of the WiFi hotspot location, this suggest that an individual must be in a health state that will not make them vulnerable to any criminal activity travelling to and from the WiFi hotspot.

Respondent 6: *"..inside it is safe, but outside it is not safe. Because the criminals target here. They can see that you have a fancy phone and then they just let you finish and when you get put they just come take your phone."*

When it comes to individual health resources, it was difficult to directly elicit or access information about people's health. The researcher could not directly interrogate people's health status and the researcher chose to discuss with respondents about disability to a sense of individual's health resource.

When it came to cultural and natural resources, there were no responses that seemed to make any reference to these two resources.

According to Kleine (2010) resource-based agency as discussed in the choice framework can only be realised within the confines of given structure. Structure and agency relationships is discussed in the next section to understand the interplay between the two concepts.

6.4.2 Structures

Kleine (2010) argues that resource-based agency of an individual is a shaper of, and is shaped by the structure in which it operates. She further argues that the interplay between agency and structures is important as agency can only be realised within the confines of a given structures. Ratan and Bailur (2007) argues that studying just agency is not enough, we have to understand the social structures that can constrain or enable the individual resource-based agency to make decisions. In Kleine's (2010) Choice Framework, 11 types of agency resources are specified where structure is located above agency to visually depict the importance of structure in the development process. The Choice Framework also depicts that structure and agency shape and reshape each other in the development outcome process. Karanasios (2014) supports Kleine's (2010) position that agency and structure can be "co-constructed," implicitly or explicitly. According to Kleine's (2010) Choice Framework, the relevant elements of the structure that directly influence an individual's agency include institutions and organisations, discourses, policies and programmes, formal and informal laws and access to ICTs. The results

indicating the structural factors that impact the complex relationship with an individual's resource portfolio are discussed below.

Institutions and organisations

The results suggest that only a few respondents were aware of the institutions that are involved in ensuring that free public WiFi is accessible to the public. Respondent 5 and Respondent 6 indicated that the City of Johannesburg was involved somehow in ensuring that free WiFi is available, however, they were not aware on the level of City's involvement. The CoJ was not the only institution involved in the provision of free public WiFi, the libraries and community centres were existing institutions that worked alongside the CoJ to ensure that infrastructure and hardware required to operate WiFi hotspots were accommodated and housed in secure locations. Respondent 1 indicated that the University of Johannesburg was involved in providing awareness and training to users on how to connect to the WiFi hotspots.

***Respondent 1**:" ….(mmmmmmhhh)….when was that? …..It was lasssssst year. Mid last year (2017). The student from UJ (University of Johannesburg) they came here to connect us to the WiFi. To make this WiFi work properly. To give us some advice."*

***Respondent 5:** "No you don't, I think they are working hand in hand with the City of Johannesburg in terms of the municipality."*

***Respondent 6:** "Someone was thanking the City of Johannesburg that they got a job by applying through this WiFi."*

While Respondent 1, Respondent 5 and Respondent 6 had some idea of the institutions involved, Respondent 4 had no idea of the institutions and organisations that were involved in the deployment of these WiFi hotspot. Respondent 4 indicated that he tried to find out who was involved with no success.

***Respondent 4:** "….I am not sure whether it is the government that is paying for this. Maybe it is someone who has invested." […] "I have tried to research, but there is no one who can tell you the truth." […] "They just say it is the counsellor, the counsellor! the counsellor!….and the counsellor cannot give free WiFi."*

It is important to note that despite the fact the respondents are or are not aware of the institutions that are involved in the project of rolling out WiFi hotspots, these institutions still impact individual agency. The policies, laws and access regulations that the institutions put in place impact the agency that an individual has when it comes to the freedom and choices that the CoJ residents are able to exercise. The researcher was aware that the free WiFi hotspot is the project of the CoJ due to the intensive research that he had conducted. The libraries and community centres where the WiFi hotspots were deployed were funded through local (municipal) government taxes. The CoJ partnered with the University of Johannesburg to provide support in training users as part of the project. Currently, the institution (the

structure) directly impacts individual users' agency, however in the long term such agency may influence the institution as residents become aware of the ways that they can interact with and influence the city government. But first, the issue of access to internet connectivity must be addressed before we can see this interplay between institutions and agency. Currently, users of the free public WiFi hotspots have no, or limited impact on what the institutions involved in the deployment of these WiFi do. The CoJ local government is enabling agency by rolling out the free WiFi hotspots that may have a positive influence on how agency influences institutions, enabling people to start participating more in local government. Once access to internet connectivity challenges have been addressed, residents can start to communicate their needs and desires back to the government. At this stage, there is no evidence of this interplay where agency influences institutions.

Policies and programmes

- **Policies**

According to the DFID (2000), policies have a direct impact on whether users are able to achieve their desired outcomes. DFID (2000) argues that policies determines the type of access, the types of resources that an individual has access to and influences the decisions available as decisions are guided by the structural policies. Policies "*determine access to assets and influences decision making processes*" (GLOPP, 2008:3). These results support GLOPP (2008) and DFID's (2000) arguments that policies can enable or hinder capabilities of an individual user. Respondent 6 indicated that while WiFi hotspots are a great initiative, the limited amount of data (300MB per day) that is available to a user are little for her to achieve the life that she values. She indicated that as a student, the 300MB is not sufficient for her student needs. The policies are limiting the resource portfolio that users are able to access. Respondent six further indicates that she has thought of studying online to improve her educational resources, however, the policies that are in place, where a user is given 300 MB per day made her decide not to go ahead because when the 300MB depletes, she would not have any other way to continue with the studies for the day.

Respondent 6: *"Yes there is, you only get 300 megabytes per day." […] "It is so little, honestly it is so little. Especially if you are a student it is even worse. Actually it is very much little. Most people just get here to download useless things. I am not saying some people should not use WiFi or anything, but I think depending on what you are using it for, the 300 megabytes is too little." […] "I did think of studying online." […] "I am thinking of doing my FAIS credits online." […] "the problem is if you are studying online, 300 megabytes per day gets finished. And now I don't enough data to finish. So I don't even attempt that because it is not going to be much of a gain for me because when the data depletes I will be stuck."*

While the policies seemed like a hindrance for Respondent 6, Respondent 2 and Respondent 5 have embraced the limitations provided by the policies. To ensure that the 300MB does not get depleted, they have opted to use their WiFi for things that they value and consider to be important to them and would require less data. Respondent 5 indicated that he has not reached daily limit as he only focusses on searching for jobs and accessing his email. Respondent 2 shared the same view, he also uses his data to access school documents and does not do things like accessing YouTube. Respondent 2 and Respondent 5 feel a sense of agency. Rather than feeling constrained by this policy decision, they are feeling that they have some level of control on the choices that they have to make to ensure that the 300MB doesn't gets depleted. The results from the two respondents support GLOPP's (2008) argument that policies influence decision-making processes, as we can see these respondents' decision making on what to access were now constrained by the policies in place.

Respondent 2: *"they give you like 300MB." […] "Isn't it 300MB?" "that is the maximum per day" […] "When you do school work like downloading document, it doesn't finish it. The 300MB only finishes when you go to like YouTube."*
Respondent 5*: "you are given 300MBs per day." […] "Yes there are limitations, but I have never finished my 300 megabytes ever since I started using this WiFi….because I am mainly on Gmail and job search engine, so it doesn't require a lot of data."*

Respondent 3 and Respondent 10 indicated that the policies limited the choices they have with regard to the information they would like to consume. These respondents indicated that the WiFi hotspots had some websites that were blocked that they would have loved to access. Respondent 10 indicated that websites to download videos from YouTube had been blocked. This limited the amount of choice they had in enabling them to achieve the life that they value and consider to be important based on their lifestyle. The results from Respondent 3 and Respondent 10 are in support of GLOPP's (2008) argument that policies determine type of access an individual has to assets/resource portfolio.

Respondent 10: *ahhh!....There is a website that download things from YouTube, I think it is blocked so you cannot download things from YouTube.*
Respondent 3: *"last year (2018) it was limited to 300MB per day. And also there were limited websites you could access." […] "I was not happy because like I said it was slow and it was also based on how much time you have spent on the Internet. So it was always busy saying connecting connecting, while you data is being finished. And by the time you check, it says "your daily limit has expired".*

While other respondents seemed to be discouraged by the policies in place as they limit the choices that they have, Respondent 4 was advocating for more policies that restrict choices that individual users

have. Respondent 4 indicated that there are some websites that must be blocked as they are not beneficial to user's development in any way.

Respondent 4: *"there should be one (restrictions), because little kids can just come here with smartphones. There will be nothing that they will investigate" […] "They will just use it for some naughty stuff like pornography and other things." […] "some kids come here and access pornography. I have seen some kids." […] "Those sites are not blocked because I once saw one from this young guy. You can even download. Myself, when I am finished with my researches, I can download a movie, they are not blocked. " […] "there should be some sort of restrictions."*

The results from the policy section indicate that a policy applied to the same group of people will have different impact on the individual's sense of agency depending on an individual. This shows that development is a choice as from a policy some individual will feel constrained, while other users can respond with a sense of empowerment on what they can do to manage the policies in place.

- **Programmes**

When it comes to programmes in place, the results suggest that the CoJ in association with the University of Johannesburg and AlwaysOn ran a campaign that provided free training on how to connect to the WiFi hotspots as well as to raise awareness of the capabilities that are being provided by free public WiFi hotspots. Training was provided to those users who needed guidance when it comes to technology and awareness was raised among people who were digitally literate. The results suggest that there were enough programmes in place to raise awareness as well as to provide support where needed. From the results, we can gather that there were wall posters, radio adverts, word of mouth as well as in-house assistance by people from associated institutions.

Respondent 1*: "….(mmmmmmhhh)….when was that? …..It was lasssssst year. Mid last year (2017). The student from UJ (University of Johannesburg) they came here to connect us to the WiFi. To make this WiFi work properly. To give us some advice." […] "Yes, because most of the people were not aware of this WiFi. When the student came here, they were so helpful connect us…to let us know about this WiFi. So now everybody now is ok. Now everybody is just cruising on this WiFi because of those students."*

Respondent 3: *"ohh jah (yes), there were people that were training us. They helped us to register our accounts." […] "so they informed us about the Joburg free WiFi. So that is when it started 2 years ago." […] "Like…it was the people from Joburg free WiFi. They were here, they were here….they were wearing like the orange…like those bibs that are worn by traffic cops to ensure that we can identify them. They were written 'Always-On' ."*

Respondent 6: *"Started by when I saw a lot of people just seating around the library having their laptops and cellphones, Then I asked what is happening there. Then they said there is actually WiFi. then months later I heard it on radio." […] "Someone was thanking the City of Johannesburg that they got a job by applying through this WiFi."*

Respondent 8: *Some couple of year back, when you get here at the Library. You would find about adverts on the wall talking about WiFi hotspot.*

Respondent 11: *"Obviously there are signs." […] "There were signs, there were signs on the wall that there is free WiFi"*

The programs that had been put in place by the CoJ created agency for users by empowering individual users with the relevant skill that are required to use the WiFi hotspot as well as for users to gain awareness of the WiFi services that is available to the residents.

Discourse

There is an overall positive discourse when it comes to the free public WiFi hotspots. The results suggest that people are impressed with the free public WiFi hotspots and are saying good things about the place as it improves the choices that CoJ residents have when it comes to internet access. The positive discourse has important implications to the way society understands and reacts to the WiFi hotspots. This has resulted in more people going to the hotspots as there is a positive word of mouth about the WiFi hotspots and has resulted in a new hype around WiFi hotspots. The positive discourse on WiFi hotspots has also changed people's perceptions around libraries as most of the WiFi hotspots were located in library centres. People no longer just associate libraries only with books and being a boring place; the library is now seen as an information hub that is digitally enabled to allow users to participate in the information and knowledge economy.

Respondent 1: *"Most of them, the people I come across with say good things about this place. Because everything you can do here. There is home affairs, there is licence department. Because this is a civic centre. It has many things that can help the people. The clinic is there, there is also a taxi rank outside, the train station is just outside there."*

Respondent 6: *"we do talk and honestly, we are thankful that there is WiFi here, the little that the government is providing. But other than that, if they could do in different areas."*

Respondent 4: *"I know new people who come here and come and give me the feedback about this place" […] "They say that this place is so good. But the only thing that they talk about is the WiFi, not the books on the Shelf. It is only about the WiFi."*

Respondent 3: *"Yes, my friends do come here, jah my friends." […] "They seem to be impressed." […] "Because the network is good, they can do anything and it is faster."*

The discourse around the amount of broadband data available to user per day was however mixed. While some respondents were complaining about the amount of data being not sufficient, other respondents were emphasising the point of decision making when allocating resources. These respondents argue that based on what you do with the WiFi, the data available for the day can either be little or sufficient.

Respondent 6: *"It is so little, honestly it is so little. Especially if you are a student it is even worse. Actually it is very much little. Most people just get here to download useless things. I am not saying some people should not use WiFi or anything, but I think depending on what you are using it for, the 300 megabytes is too little."*

Respondent 10: *I am not really aware of the 300MBs hei. […] "I would feel robbed or something." […] "I don't know…I think it is not enough" […] "At least a gig per day would be sufficient"*

Respondent 7: *"The thing is a lot of people abuse the WiFi here, there is only a few people who use the WiFi for academic purposes. A lot of people come here to watch YouTube videos and download music, so the 300 megabytes will not be enough. So I think even the people who implemented the 300 megabytes per day just wanted people not to abuse the WiFi."*

Respondent 8: *"Well!...For me it is sufficient, as long as you are going to do something constructive." […] "As like Ok!....I wanna check my emails, I wanna send CVs…I want to check on what is going on with the news."*

Respondent 9: *"No, I have never run out of the 300MBs, because it depends on what you are using the WiFi for. Videos are obviously going to eat more."*

The results suggest that there is a discourse of uncertainty when it comes to reporting WiFi availability issues or complaining about the service when the WiFi hotspot is not working. The majority of the respondents indicated that they cannot complain as they are not paying for the services. They are also not sure who to raise the issues of availability with or who to complain to about non-availability of services.

Respondent 4: *"Yes I've come here and the WiFi was not working." […] "I felt disappointed because I wasted my R16. But I had no one to shout to, so I just kept quiet. And they explained to us." […] "I would have complained, but I would ask myself that "did I pop out some money on this?"" […] "When I don't pay, I must know my place. Because I don't know who pays for this." […] "I don't have any say because I am not sure whether it is the government that is paying for this. Maybe it is someone who has invested."*

Respondent 5: *"Well I was heartbroken. Considering the 35 minutes' walk to get here. I was heartbroken. If you Consider the 35 minutes' walk to get here and another 35 minutes to go back and no one knows when it is going to be back up again. They are just telling us that they have reported it to*

the service provider, so we must just keep on checking. I was here it was not working, I came here yesterday and it was off. I came today it is working."

Respondent 6: *"It is not nice, it is not nice. Like you have to do what you have to do for your own life. Like I said it is dangerous here and criminals. Anything can happen." […] "We don't know, we just say ok it is not working and leave. We don't even know who to complain to. I don't even know where the aerial is coming from. I just know that if you are lucky it connects here and if you are lucky it connects in the library or outside. This side is more dangerous, I don't even think of standing here."*

Respondent 7: *"ahhh!....what can we say. There is nothing I can say. It is free stuff, I can't complain. It seems as if it was not working in all the libraries around, the server was not working."*

Respondent 10: *"life goes on man….it is slow….you go back home"*

This discourse of uncertainty shows that in some cases, the respondents lack agency. This is where institutions have more influence over their agency while the individual's agency has no or limited influence on the institutions.

Formal and informal laws

In the Choice Framework, resource-based agency exists among institutions and organisations, discourses, policies and programmes, as well as formal and informal laws. The framework holds the view that in order for ICTs to impact people's lives, these ICTs must operate within broader strategies that are tailored to make the most use of these tools and techniques (Hamel, 2010). (Kleine, 2010) argues that the presence of formal and informal laws shapes individual opportunities. According to Kleine (2010), for resource-based agency to be realised, there has to be an interaction between agency and structure; in this case, formal and informal laws. Kleine, (2010) further notes that most ICTs come with formal and informal laws that govern use and use is later framed by the norms of the usage of space and usage of time. Findings derived from norms of the usage of space and usage of time are discussed in the sections below.

- **Norms on usage of space**

The results suggest that users are aware of the norms on usage of space. Respondent 1, Respondent 3, Respondent 4, Respondent 5, Respondent 7 and Respondent 8 indicated that users can stand or sit anywhere as long as the user is within the WiFi aerial range. The results support Ratan and Bailur's (2007) argument that structures can constrain or enable the individual's resource-based agency to make decisions. In this case we can see that the WiFi is limiting the users' decision on how they would like to use the space. The results on the norms on usage of space also shows that by simply not seeing anyone around the WiFi hotspot, it could mean that the WiFi is not working. Respondent 8 indicated that when there are no people around it could mean that the connection is not strong enough or the WiFi is not working. Norms on the usage of space made it easy for these respondents to go to WiFi hotspots as

most of the users were within the student-age group, meaning that the respondents did not feel out of place when they visit these locations as they were within their peers (youth).

Respondent 1: *"You can seat anywhere. Even outside as some are not coming here to study or to read. They just come for WiFi."*

Respondent 3: *"You can seat anywhere; the hotspot is here. As long as you are in range you can seat anywhere."*

Respondent 4: *"Yes, you can seat anywhere."*

Respondent 5: *"well…people are using it outside here. You see all these people seating outside here? they are accessing WiFi as well." […] "No you don't have to be necessarily inside."*

Respondent 7: *"You can seat or stand anywhere."*

Respondent 8: *"Ok..just outside here, it is a WiFi hotspot. You will see people seating here connecting to the WiFi. Sometimes when it is empty like now, you will find that the connection is not good."*

Respondent 11 and Respondent 12 who were from the same WiFi hotspot location indicate that their usage of space differed based on the main reason that users went to the location for. They indicated that there were some areas where there is no WiFi within the library as those rooms are used for group discussion or by people who want to focus and not be disturbed by WiFi.

Respondent 11: *"Ammm!…I prefer to be on this side that we are coming from (pointing to the door on the right on the first floor)…because mostly on the other side you find that students are having discussions and all that. So there is usually noise."*

Respondent 12: *"This side has WiFi…..I am not sure about other places…but there are rooms that don't have WiFi. I think that side without WiFi is for people who get easily distracted by WiFi, so they are like let me go that side, because when I come this side….Ayyyy!"*

Respondent 6 from the Orlando East community library indicated she did not feel safe when outside the WiFi hotspot, she only felt safe when she was inside the library. She indicated that even though the WiFi range extend to a longer distance even when outside the library, she only uses the WiFi when she is inside the library as there are criminals who are targeting WiFi hotspot users who are seated outside these WiFi hotspot. The WiFi hotspot have become a target because criminals know that when users are seated around the WiFi hotspot, they do have some sort of a device they are using to connect. This has resulted in a norm where most WiFi hotspot users only use the WiFi hotspots when they are inside the library unless there is a bigger group outside that is also using the WiFi hotspots. This norm prevented users from getting their devices stolen by criminals.

Respondent 6: *"It is very much safe.inside it is safe, but outside it is not safe. Because the criminals target here. They can see that you have a fancy phone and then they just let you finish and when you get put they just come take your phone."*

- **Norms on usage of time**

The results suggest that users are aware of the norms on usage of time. The respondents were aware of the times when the WiFi locations open and when they close. Respondent 6 indicated that even though users are aware of the norms on usage of time, this poses a limitation on her choices as the library closes at one o'clock on Friday meaning that she could only use the WiFi hotspot for a few hours on Friday which then limits her choices. Respondent four indicated that the norms on the usage of time meant that he could only use the WiFi hotspot when he was not supposed to be home doing domestic chores when his mother is still at work, this meant that he had to leave the hotspot early before his mother gets home from work. Respondent one indicated that he has a friend who usually goes to the WiFi hotspot after work, the norm on usage of time meant that she could only go to the WiFi hotspot to connect only when she has knocked off from work.

Respondent 1*: "The library closes at five o'clock, but on Friday it is one o'clock". […] " there is no time limit." […] "Yes I have….there is this friend of mine, she is on duty now. she is a domestic worker. When she knocks off work, she comes here to connect so that she can chat with her family."*

Respondent 4: *"Yes, you can enter the library from 9 o'clock and exit at 5 o'clock." […] "Yes, there is no time limit. Even at night, you can stay there and access the Internet." […] "Its is not safe, but you can still access the Internet." […] "…someday I was here and I was supposed to be at home doing domestic work at home. I spent most of my time here and went home very late. My mother was not cool with me."*

Respondent 6: *"Inside there is, on Fridays the library close at 1pm. If you are coming here after that, it means you will have to seat outside. The sun…actually the weather can be a problem. Outside there is also a risk of theft as well." […] 'you only get 300 megabytes per day if you are using the WiFi.." […] "It is usually packed, depending on the months. But recently since the WiFi and the Internet was working, most people didn't come."*

Respondent 9: *"It closes at 5 o'clock whereas the one in Savoy it opens until late during the week as well, but on Saturdays it closes at 1. This one is still open until 5 even on Saturday."*

Gerster and Zimmermann (2003) and Kleine (2010) argue that, with regards to ICTs, formal and informal laws influence an individual's agency by potentially limiting or enabling the availability of ICTs, affordability and the capabilities needed for different ICTs.

The results of the last element of structure, Access to ICTs, that encompasses availability of ICTs, affordability of ICTs and necessary skills for ICTs is discussed next.

Access to ICTs

Kleine (2010) conceptualised access to ICTs as the combination of availability of ICTs, affordability of ICTs and necessary skills for ICTs. The results are discussed below.

- **Availability of ICTs**

The results suggest that the deployment of free public WiFi hotspots made internet access possible for people who would have not been able to access the cyberspace due to their resource portfolio constrains. The availability of WiFi hotspot technology in the identified locations provided people with an option to access the information to achieve the life that they value and desire. The results also show that WiFi hotspots have resulted in widespread internet penetration in those location as more users are now able to access the Internet, resulting in more people being digitally included. This is solving the bigger South African issue of low internet penetration. The results also suggest that while WiFi hotspots were available in some areas, they were not convenient for everyone to reach them. Respondent 6 indicated that she had to walk for 14 KMs to and from the WiFi hotspot location. This shows that while free public WiFi hotspots are available in some areas, some areas are still excluded as these free public WiFi hotspots are still not available in conveniently accessible locations for other possible users.

To get a sense of the availability of WiFi hotspots, the researcher posed the following questions: *Is the WiFi hotspot available every day?* and *Are there days when this WiFi hotspot is not working?*

The results from Respondent 1, Respondent 10 and Respondent 11 indicated that in those locations where WiFi hotspots were installed, WiFi was always available. The results show that even when the library has closed (norms on usage of time), users can still access these WiFi hotspots from outside as long as they are still within the WiFi range.

Respondent 1*: "Most of the time it connects so easily and it is fast. It is faster than using data. It connects easily and faster." […] "You can even stay for the whole day. Even when the library is closed, you can stay outside. Because there are securities, you can just say "I am coming for the WiFi, there is something that I need to do". Then you can connect outside." […] "Yes, it is available. Even on Sunday, even when there is a thunderstorm, even when there is snow, this WiFi is still working." […] "I don't remember it not working. I have never experience it."*

Respondent 10*: "….There is a day when it was very slow….not necessarily entirely not working."*

Respondent 11*: "Since I know this WiFi, it never took so long (laughing). It worked, sometimes it is always slow….but we never experience such a thing that totally! totally! it does not work. So we do*

experience a problem that it is slow for the day….Especially during the week, but on weekend, because there are not a lot of student on weekend; it is fast."

The results from Respondent 1, Respondent 10 and Respondent 11 indicated that WiFi was always available, responses from Respondent 6, Respondent 7 and Respondent 8 indicated otherwise. The results from these respondents indicated that the WiFi was not always readily available. The respondents indicated that just a few days before the researcher conducted the interviews, the WiFi had not been working for a few days and only came back on the day the researcher visited the location. Respondent 8 indicated that the availability of the WiFi is also dependant on weather, when the weather is not good (raining or windy) the WiFi doesn't work. Respondent 8 also indicated that when going to the WiFi hotspots he always go there mentally prepared that the WiFi might not be working to avoid disappointment. Respondent 6, Respondent 7 and Respondent 8 were from region D, Soweto. This could be an issue with the WiFi infrastructure in Soweto and not necessarily a wide-spread problem in other locations. Respondent 6 was from the Orlando East library and Respondent 7 and Respondent 8 were from the Orlando East community centre.

Respondent 6: *"it is horrible, it is so much horrible. The last time it worked it was last week. The whole of last week it was not working." […] "You just have to lick your wounds and go back home. It is painful, it is painful because if you could afford the data, I would just stay at home. The reason I come here is because I am thinking I will be able to apply and do this and that. It if is not working it hurts."*
Respondent 7*: "Yes, from Saturday, Monday, Tuesday, Wednesday. It only started working again today. They said it was offline." […] "ahhh!....what can we say. There is nothing I can say. It is free stuff, I can't complain. It seems as if it was not working in all the libraries around, the server was not working."*
Respondent 8*: "Yes there were, there are certain days….when the weather is not good, you find that there is no connection or anything. There are certain days when you just can't connect." […] "For me, I come with the mind that I might just not get the connection." […] "I know if I don't find the connection, this is something else I am going to do."*

- **Affordability of ICTs**

The results suggest that the current level of affordability of the WiFi hotspots is one of the key factors contributing to the user's positive attitude towards these WiFi hotspots. The current structures (institutions, policies and formal laws) for users of the WiFi hotspots stipulated that access was free (affordability of ICTs) however, it was limited to 300 MBs per day per person (policies). The results indicated that most users complained about the South African data prices being too expensive or unaffordable. However, since the price of data had effectively fallen, given that users did not have to pay for using the WiFi hotspots, this made it possible for more people to access the Internet. The results

also indicated that users would rather sacrifice transport money and not buy data, but rather take a taxi to the WiFi hotspot, because they will have enough data to do what they value and consider important in their lives. Respondent 4 indicated that it is like he is buying airtime when he takes a taxi to get to the WiFi hotspot location.

Respondent 3: *"I use this WiFi because it is easy to access free information….currently I don't have data like other people, so stuff like this that are free also helps us to do research." […] "ahhhh!... I use a taxi to get here. Return is R24." […] "The data I will get for that amount(R24) is little as compared to just coming here. Here I get more benefits."*

Respondent 4: *"I can't afford data, so I use the free WiFi here." […] "because data is expensive." […] "It costs me R8 and return R16." […] "Data is very expensive, and here WiFi is unlimited. And with the R16, how many megabytes will I be able to buy. It won't last, here I can download many things. I can do many researches." […] " it is my sort of buying airtime. I am buying data when I take a taxi to get here."*

Respondent 6: *"I use this WiFi mostly because data is expensive, very much expensive. Most of us are unemployed and when you have to apply for jobs or check your email, you need to go to the WiFi. Basically, it is because of affordability of the data, since we cannot afford data, it is a good idea to come access the WiFi here."*

Respondent 9: *"it helps that there is free WiFi here because I don't have to stay at home" […] "So it does help, otherwise I would have to use my phone. If there wasn't WiFi I would have to use my own data" […] "Why would I use my own data (laughing)…because there is free WiFi. Data is expensive in South Africa."*

Respondent 11: *"Because…people…especially we black peole, we don't have money. So internet is expensive…buying data is expensive. I think the introduction of WiFi made it easier for people to get into the information. Whatever information that they want."*

Respondent 7: *"This WiFi is the best because it is free. Data is expensive." […] "I don't have to pay and the speed is reasonable." […] "if I were to pay I wouldn't use this one." […] "If I were to pay, I would expect a better speed. Currently this WiFi is not the fastest."*

Respondent 12: *"I use a taxi to get here. […] Yohh!!! R16…. Yes and R16 to go back, so it is R32."*

- **Necessary skills for ICTs**

The results show that City of Johannesburg in collaboration with the associated institution stressed the importance to become "digitally literate" and offered training to those users who seemed like they struggled with connecting to the WiFi.

Given that a lot of users are in the student-age group, most of them had already acquired the skills to navigate the Internet and to run computer or mobile application from their formal or informal education.

Respondent 11 indicated that with his previous experience and education, since he had studied information technology (IT), there was no need for training it was easy for him. Respondent 7 indicated that he was a computer science student, indicating that he already knew about WiFi hotspots and how to use them. From the result, it is also evident that most of the users knew how to use the WiFi hotspots from their previous experiences (education, work, informal training etc.). The results from the respondents also indicated that those who struggle to connect were offered training by people from associated organisation some acquired the necessary skills through their social resource. Respondent 6 indicated that she asked one of the WiFi users to show her how it works when she firstly got to the WiFi hotspot.

Respondent 7: *"I know how to use it. I am a computer science student."*
Respondent 1: *"Mid last year (2017). The student from UJ (University of Johannesburg), they came here to connect us to the WiFi, to make this WiFi work properly and to give us some advice." […] "when you got a phone like this (pointing at the researcher's Samsung S9 phone). They would ask "are you already connected, are you already connected to the WiFi?" I said no. They said, "let us connect you". So they register, the login and they do everything. And then I started to connect."*
Respondent 8: *"Not really, but it is more or less a matter of following instructions. It is a simple process." […] "you can just read and understand."*
Respondent 6: *"I just asked someone to show me first time, then the next time you just remember what they showed you." […] "It is much easy."*
Respondent 5: *"Not really, there is not training because it is simple and straight forward. There is no need for training."*
Respondent 11: *"No…because of my experiences…you just ahh!....or knowing technology or just my phone. You just activate the WiFi without a pin code or whatever." […] "I have done IT." […] "so thing around internet I know them."*

In understanding who the users are, the results support Kleine's (2010) argument that the resource-based agency of an individual is a shaper of, and is shaped by the structures in which the individual operates. She further argues for the importance of the interplay that exists between agency and structures, as agency can only be realised in the confines of a given structures. The results indicated that individual characteristics influence the resources portfolio that an individual has access to. The gender, race and age can determine the nature of the resource portfolio that an individual has access to. The results also supported Kipo's (2014) argument that some individuals will have have more influence than others based on their personal characteristics which then impacts the resource portfolio that they have access to.

The results indicated that to understand the users (agency), we have to go beyond just resource-based agency. The results indicate that to understand the user, researchers also must understand the structures that shape their agency. The results support Ratan and Bailur's (2007) argument that studying just agency is not enough, we have to understand the social structures that constrain or enable the individual resource-based agency to make decisions. The results indicated that the institutions, policies, programs and laws in place can shape the type and amount of access that an individual has to ICTs which then directly influence the resource-based agency of an individual. In line with the findings, this study found that agency and structures are a key concept in studying the users of WiFi hotspots in the context of the City of Johannesburg in South Africa as it better helps a researcher to explain the users by being able to explain why users behave or do things in a certain way.

6.5 Research Question 2: What do users use the free public WiFi hotspots for?

Objective 2: To understand what the CoJ residents use these free public WiFi hotspots for.

Theoretical Lens Concept: Dimensions of Choice

The results from theme one indicated that to negotiate the social structure, individuals use their resource-based agency. Individuals are constantly making choices aimed at enabling them to achieve the kind of life they value and want to live. According Kleine, (2010), the aim of development is to enable an individual to expand their freedom to choose. To better understand individual's freedom to choose, Kleine (2010) introduced dimensions of choice in the Choice Framework in order to enable analysis of how development outcomes were reached. The Choice Framework was based on Alsop and Heinsohn (2005) conceptualisation of choice in three dimensions that were referred to as degrees of empowerment consisting of: the existence of choice, the use of choice and the achievement of choice. Based on Alsop and Heinsohn's (2005) conceptualisation of choice, the Choice Framework adds an additional dimension that is situated between the existence and use of choice. This dimension is called sense of choice. Kleine (2010) argues that this dimension is necessary because the mere fact that a choice exists does not mean that people have a sense that the choice was available for them to choose from. While Attwood and May (2015) summarised the dimension of choice as options, decisions and actions. The Choice Framework is made up of four dimensions of choice namely: existence of choice, sense of choice, use of choice, achievement of choice. Below the researcher discussed what individuals use the WiFi hotspots for and how the dimensions of their choices enabled CoJ individual users to achieve the life they value and reach their desired results.

To get a sense of what CoJ residents used the WiFi hotspots for, the researcher posed questions like: *What do you use this WiFi hotspot for?, Is that the only task(s) you use this WiFi hotspot for?* and *Have you tried to use it for something else?.* The results indicated that individuals used the opportunity to choose to perform various task to achieve the life they value and consider to be important. The results

indicated that the use of choice was not only allocated to one thing, users made choices to perform a mixture of tasks that they value. While respondent 1 used his WiFi access for tasks like applying for jobs, studying, business research etc., the results indicate that users use their WiFi hotspot access for various tasks that help them to achieve the life that they value. There seemed to be a trend on people mostly using the WiFi for study purposes as well as gaining access to the job market by searching for and applying for jobs. The results come as no surprise since the frequent users of these WiFi hotspots are student-age group and the student-age group is likely to be mostly involved in economic activities like full-time or part-time studies and the majority of the respondents were unemployment.

Another factor that could have influenced the results could be the fact that eight out of the 12 interviews were conducted during the week, so users who are employed were not present at these locations during the data collection process because they were at work. Therefore, the views of people who are employed were not fully captured in the study, as they were mostly at work when the data was collected.

The top five things mentioned by respondents as the main tasks that they use the WiFi hotspots for are: educational purposes (studying, educational research etc.), job seeking, business purposes, multimedia downloads and social media. These are the top five tasks that CoJ residents value and have a reason to, given that development is a choice. Below the researcher presents the findings on the top five tasks the CoJ residents use the WiFi hotspots for.

6.5.1 **Educational purposes (studying, educational research etc.)**

The results suggest that most of the CoJ residents use the WiFi hotspots for educational purposes. Alsop and Heinsohn (2005) and Kleine (2010) conceptualised the use of choice as an indication of whether an individual actually makes the choice or not. The use of choice highlights if a person actually uses the opportunity to choose or takes an action. The CoJ used their freedom to use the free WiFi hotspot for educational purposes. According Kleine, (2010), the aim of development is to enable an individual to expand the freedom to choose, the availability of WiFi hotspots enabled the CoJ's freedom and they expanded their freedom by choosing to use the WiFi for educational purposes. To support this argument, Respondent 1 indicated that he uses the WiFi hotspot for education as there are educational document that he needs through access to the Internet.

Respondent 1: *"…I use it for school purposes." […] "there are some documents that I need that they upload at school"*

Respondent 2 also indicated that he used the WiFi hotspot to access school documents. Due to WiFi being available at the Lenasia library, Respondent 2 was able to go study in a different location rather than staying at home as the WiFi allowed him to access the student portal for his education needs even

when he was not at home or at school. He was then able to achieve his desired outcome to continue accessing school documents even when he is not on campus.

Respondent 2: *"For me ahhhh….there are some documents that I need that they upload at school." […] ":Yes, I use it for school purposes" […] "It is nicer, you know sometimes you wanna go home (during recess) and you wanna study in another place. If they didn't have WiFi here it would be difficult. I would have to stay at school and study there. Sometime you know you just want to find another place….a different environment."*

Other respondents also noted that:

Respondent 3: *"Most of the time it is school kids, when they come out of school, they come over here to study."*

Respondent 4: *"Like when I am studying, there is a lot of questions or a lot of stuff that need the WiFi. I can't afford data, so I use the free WiFi here." […] "I use it for studying." […] "I use the Internet as my textbook and I also get some textbooks on the Internet. And then I download them and study."*

Respondent 7: *"Most of the time the things that I work with are online. There is this thing that I am working on. It is called MIT OpenCourseWare from Massachusetts Institute of Technology. So what they do is that all their courses are posted online. Question papers, lecture notes and lecture slide. So for my modules like maths and computer science, I use material from MIT (Massachusetts Institute of Technology). The only way I can access them is through the Internet." […] "I use it for school purposes." […] "No I don't study at MIT, I am a student at UNISA" […] "I use it for academic purposes only." […] "Yes I only come here to study, when I am bored I just use Google."*

Respondent 8: *"I am currently studying. So my first priority is to study, and then if I do get a connection I can then take an hour or so to do some research. First thing I know is….lemme do what I came here to do which is to study."*

Respondent 9: *"I use it to like…Submit my assignment in my UNISA portal. I am studying long distance and I have a full-time job." […] "I use it for studies mainly for articles or there is a case study that I need….for instance, I don't have that text book today, but I am also studying Business Management and there is a book. Well it is not a prescribed textbook but a recommended book which I didn't buy because I can still find the information in the prescribed textbook online" […] "I do, for instance there is an online free course. Like the one I was looking at now. For instance this one is an online course on how to grow your Instagram following. This one is a course, so I also do use it to access different online courses. Sometime I take those classes as well." […] "It is Shopify Academy (*https://www.shopify.com/academy*). There is a lot of short course on digital marketing. Because I am not a marketer, I had to learn when I built this e-commerce store. I realised I didn't know anything about marketing."*

Respondent 10: *"I use it mostly for my assignments and studying for tests."*

Out of the 12 respondents interviewed, eight of them clearly presented the evidence that indicated that most of the CoJ residents use their freedom to choose to access information, material etc. that enable them to meet their desired educational outcomes that they value and consider to be important for their development.

6.5.2 **Job seeking**

The results indicate that CoJ residents use their WiFi hotspot access for various tasks that help them to achieve the life that they value. It emerged from the data that the second thing that the CoJ residents use the WiFi hotspots to look for jobs on the Internet. Respondent 1 indicated that he uses the WiFi to apply for jobs on Indeed job portal (https://www.indeed.co.za/) and he had been able to achieve his choice as he was going for a job interview the next day.

Respondent 1: *"even me, tomorrow I am going for an interview. I applied through this WiFi on Indeed job portal. I went there and applied, now they called me yesterday and they sent me an SMS that I must come for an interview by 8 o'clock in Johannesburg".*

Respondent 5 also indicated that he uses the WiFi to apply for jobs and he had been invited to a couple of interviews since he started applying.

Respondent 5: *"I come here to apply for jobs and to keep abreast with the current affairs. For me yeah…that is all." […] "Well I have been to a couple of interviews, I have had to cancel a couple of them because they were clashing. So it has improved the opportunities dramatically actually. That is why I am encouraged actually to come here."*

Other respondents also noted that:

Respondent 6: *"I use it normally for….except for the Internet connection, doing job application" […] "Ammm!...they have changed. Unlike buying newspaper, unlike going to government offices to check on the papers that they put on the notice board. I can now check for jobs from private companies as well as government. Basically that changed a lot, it has improved."*

Respondent 8: *"Apply for learnerships, internships. All those things in engineering. So when I come here…I know also, I also send CVs via their computers or via my phone."*

Respondent 9: *"ahh!...I have, I do get like emails for jobs. So if there is something that looks interesting, I do apply".*

Respondent 10: *"I use it for sending CVs via emails, I have used it for that."*

Respondent 11: *"I have used it for job hunting..jah!..."*

It is therefore evident from the data collected that job seeking and job applications were another way respondents exercise their freedom to choose the lives they have a reason to value. The results suggest that people who are unemployed are more likely to use the WiFi hotspots to apply for jobs as compared to those who are already employed. The emphasis on the choice of using WiFi to apply for jobs may be due to the fact that majority of the respondents were unemployed and actively looking for jobs as most indicated in their responses that they are applying for jobs.

Business purposes

The results also indicated that the CoJ residents use the WiFi hotspot for business purposes. Respondents 1 and Respondent 4 have indicated that they also use the WiFi for business research. Respondent 9 indicated that she is already running an online female boutique with the help of the free public WiFi.

Respondent 1: *"I use it for business research, for marketing, for studying, to access books that are not available in hard copy."*

Respondent 4: *"I have tried to get some business ideas. I want to be an entrepreneur. Doing law doesn't mean that I want to be a lawyer. I want to have my own corporation or my own business. So I tried to look for those businesses information."*

Respondent 9: *"I also use it for personal use, like for instance I've got an online female boutique store. So what I usually do….I divide my hours between studies, because I've got a full-time job. So weekends and evenings are only the time that I have to work on it. So from here, maybe I will dedicate like 2 hours to doing that online…like update and see..deal with the maintenance of the store. And then I will also use this for academics. So it is very convenient. everything. That what I basically use it for."*

It is therefore evident from the data that researching business information and operating an online business was another way respondents exercise their freedom to choose the live they have a reason to value.

Multimedia downloads

Another way respondents exercise their freedom to choose the lives they have a reason to value was to do use the WiFi for multimedia downloads. Respondents indicated that they use the WiFi to download music, videos, games etc. However, most residents indicated that this was not their main reason for going to the WiFi hotspots, this was a secondary task after they had finished doing what they primarily went to the WiFi hotspot for. Respondent 4 indicated that after studying that is when he starts using the WiFi for downloading.

Respondent 1: *"I also use it to download songs and videos."*

Respondent 3: *"They also use it to download music and stuff…"*

Respondent 4: *"I can download many things" […]* "*Then after studying I just download some movies and download some games just for fun." […] "You can even download. Myself, when I am finished with my researches, I can download a movie, they are not blocked."*

Respondent 6: *"I also download some stuff, like to download some videos and movies. I also check some webinars. I used to check videos with regard to trading and then the website crashed."*

Respondent 7: *"I was told by my younger brother, he usually come here to download games." […] "A lot of people come here to watch YouTube videos and download music"*

Respondent 8: *"Ok Besides, when I am done I can also do a couple of downloads as well. Music"*

Respondent 9: *"before….ahhh! (lauging) I used to load some series from Netflix…"*

Respondent 10: *"…download music and videos and anything."*

Respondent 12: *"…for downloading also." […] "I mostly download books…songs, video, motivational videos and books."*

According to Kleine (2010), an individual's agency is influenced by relevant elements of the structure and dimensions of access. The results support Kleine's (2010) argument that the dimensions of the choices available to an individual influence the individual's agency. It is evident from the results that the 300MBs policy influenced the decisions that users can make. The users used their limited agency to study and when they had some megabytes left for the day they would use the WiFi for multimedia downloads.

Social Media

The results indicated that the CoJ residents also use the WiFi hotspot for accessing social media. Again, respondents indicated that they access social media after doing what they initially went to the WiFi hotspot for. Respondent three indicated that students usually go to the WiFi hotspots to study and when they are done, they then access various social media platforms of their preference. Respondent 5 supported this argument by indicating that he also accesses social media platforms using the free CoJ WiFi hotspots. Respondents three and five further indicated that social media was not their main priority for going to the WiFi hotspots as they access WhatsApp or Facebook even when they are not at the WiFi hotspot, using their data. Respondents 6, Respondent 10, Respondent 11 and Respondent 12 also indicated that they use the WiFi for social media platforms.

Respondent 3: *"after studying, they(students) will stand here for few minutes and will start updating their WhatsApp…" […] "For those things (Facebook or WhatsApp), I can use my own data." "I use my own data." […] "Yes I can use it even when I am at home."*

Respondent 5: *"Yes, especially on my handheld device. I use it for WhatsApp, I do use it for social media." "No, I can access it (WhatsApp) anywhere anytime. But when I am, to save my data I use it."*

Respondent 6: *"it also connect to WhatsApp."*

Respondent 10: *"In terms of….let's say…let's say Skype, so I can talk to people sometime on Skype. Video call on WhatsApp because the network is strong enough to do that."*

Respondent 11: *"In different platforms like email or WhatAapp and Facebook also"*

Respondent 12: *"(Laughing)…Just general thing. And also for WhatsApp" […]*
"Jah…WhatsApp….Social media."

Achievement of choice

Kleine (2010) used Alsop and Heinsohn's (2005) conceptualisation of the achievement of choice to indicate whether the choice made by an individual matches the desired results or outcome of the choice expressed. The empirical results indicate that individual users were able to meet the desired outcome. Respondent 1 and Respondent 5 indicated that they used the WiFi hotspot to apply for jobs (use of choice) and they also indicated that they have managed to be invited to a couple of interviews from the job applications they made from the WiFi hotspot (achievement of choice). Respondent 2 indicated that he uses the free public WiFi for his studies (use of choice). He indicated that since there is free public WiFi at the library, he is able to go study in a different environment instead of staying at home or going back to campus during recess as he is able to access his school documents using the free public WiFi hotspot (achievement of choice). Respondent 9 indicated that she is a part-time student and uses the WiFi hotspot for her studies (use of choice), she indicated that she did not buy some textbooks that were recommended for one of her module, however, she was still able to access the content of the textbook online using the WiFi hotspot (achievement of choice). The results indicate that the achievement of choice also helped the respondent to improve their psychological resource (encouragement), Respondent 5 indicated that he feels encouraged to come and apply for more jobs as he is getting invited to interviews even though he hasn't yet been successful with securing a job.

According to Kleine (2010), an individual's agency is influenced by relevant elements of the structure and dimensions of access. The results support Kleine's (2010) argument that the dimensions of the choices available to an individual influence individual agency. From these choices (existence of choice, sense of choice, use of choice and achievement of choice) that an individual makes, then flows the development outcomes. According to Kleine, Light and Montero (2012) the Choice Framework is a systemic framework, where the development outcomes are based on the choices made, and may have positive or negative effects on the individual's resource portfolio, given the opportunity structures through a feedback process. From the results, it is evident that all the respondent had used their main choice, which is going to the WiFi hotspots. Whether the individual achieves the life they desire is based on the choices an individual makes on what to do with the WiFi hotspots when they get to the location. Users who went to the WiFi hotspots just to download music achieve their desired outcome when a particular song is completely downloaded to their device. While those who went to the WiFi hotspot to apply for jobs, their desired outcome is achieved when they get invited to an interview or

when they actually get the job they applied for. The achievement of the desired outcome is based on what the user decides to do when they get to the WiFi hotspot. Therefore, it is evident from the empirical data that development outcomes are based on individual agency, structures and the choice that an individual makes when it come to what they use the WiFi hotspot for. The choices made by CoJ residents on what to do with the WiFi hotspots when they get to the locations influenced the researcher's overall understanding of what the CoJ residents use the WiFi hotspots for.

6.6 Research Question 3: What are the development outcomes, if any is experienced?

Objective 4: How free public WiFi hotspots has impacted the development of CoJ resident, if any impact was experienced.

Theoretical Lens Concept: Development Outcomes

6.6.1 Principal development outcome: choice

In his capability approach, Sen (1999) argues that development focuses on freedom of choice in the personal, economic, social and political sphere. Sen (1999:3) further notes that development is "a process of expanding the real freedoms that people enjoy to lead the lives they have reason to value". Based on Sen's (1999) conceptualisation of development, Kleine (2012) argues that choice is both the aim and the principal means of development. She therefore notes that the principle development outcome is an individual's choice; this choice will determine the secondary development outcomes. Kleine (2010) further argues that secondary development outcomes are dependent on the individual's principle choice which guides the secondary choices of what life an individual values. The principle development outcome is the freedom of an individual to choose (choice). According to Gore (1997) and Sen (1999), the inability to choose from an opportunity portfolio limits individual freedom, therefore, the principle development outcome is always choice.

In this study, the principle development outcome is for the CoJ residents to have the choice to increase their access to internet connectivity.

From our interviews, the study found that by the CoJ deploying free public WiFi hotspots in various location within the CoJ regions, they provided an infrastructure that enabled choices for individual users in the CoJ regions to choose alternative ways to access the Internet. Respondent ten indicated that since the availability of the WiFi hotspot technology, they have a couple of choices to make. These choices include whether to use or not to use the hotspots and which one to use to achieve the life they have a reason to value. The principle development outcome was that the respondent had improved choices; individuals were now able to choose to visit or not to visit the WiFi hotspots to access the Internet. By the WiFi hotspots being available in those locations, the user now had alternatives on whether they would access the Internet though their own data (routers, cell phone broadband, fibre) or they could go to the free public WiFi to access the Internet. Now the respondent had improved choice on how to

access the Internet. This empowerment has a positive impact on various developmental challenges (secondary outcomes) within these communities, which then address the bigger development challenge of poverty and inclusion. The secondary development outcomes include, for example, easier communication, increased knowledge, a healthier environment, increased income, more voice, more autonomy, etc. The results of these secondary development outcomes are discussed in the next section.

Respondent 1: *"Like when I need some information that I cannot have the access on it through my own power or my own ability, WiFi makes me get those access."*
Respondent 5: *"I don't have any excuse to say I cannot do this online application in terms of jobs because I don't have data. I can always come here."*
Respondent 6: *"it is good, everything is there. Now it is just up to the user." […] "mmm!...I would say it is lack of information. Basically it is only lack of information. And some people are just not willing to take the first step….because we don't have data or we don't have WiFi hotspot in Pimville, then I will just wait until I buy data. It is just about how eager are you to get the information, to get the opportunities. It is entirely up to us."*
Respondent 10: *"Yes I have couple of choices (on how to access information online)" […] "It gives me internet access when I don't have data to do it at home." […] "Yes, now it is just a choice of me using my one, or using this one." […] "Yes I have couple of choices."*

The results from the respondents above are in support of Sen's (1999) and Kleine (2010) arguments that the principle development outcome is choice, as individual users firstly have to choose whether to or not to use the ICTs in place in order to realise the secondary development outcomes. Principle development outcome is to expand the real freedoms of an individual to choose and lead the life that they have a reason to value. If a user decides to not use the ICTs in place, the person's secondary outcomes may be limited as there was no action taken. However, if the user makes a choice to use the ICTs in place, the user is then able to achieve secondary development outcome that are aligned to the life that he/she has a reason to value and desire.

6.6.2 Secondary development outcome

According to Kleine (2010:10), "secondary development outcomes depend on an individual's choice as to what lives they value". The secondary development outcomes are as a result of individual users' interactions with ICT artefacts, in this study being free public WiFi hotspots. It is important to note that secondary development outcomes vary from one individual to another. The secondary development outcome differs based on the life that users desire and have a reason to value (Kleine, 2010). Categorising the lives we value is quite complex as there is no limit in terms of what one person can value as compared to the next person. To overcome this limitation, Kleine's (2010) categorisation of secondary development outcomes were adopted as closed codes for easy coding and grouping of

secondary development outcomes. Kleine's (2010) categorisation of the secondary development outcomes include increased knowledge, easier communication, business ideas, access to markets, more voice, increased income, time saved, higher job satisfaction etc. The results from the interviews for each category of the secondary development outcomes are discussed below. The secondary outcomes for this study were grouped/coded as the data was analysed from the interviews.

- **Easier communications**

Easier communication is one of the secondary development outcome category as per the Kleine's Choice Framework. The Oxford Dictionary (2018) defines communication as "*the imparting or exchanging of information by speaking, writing, or using some other medium (telephone, computer etc.)*". Thapa *et al*. (2012) argue that ICT helps to enhance communication which in turn can lead to development. In their study, Thapa *et al*. (2012) found that the wireless project in the mountain region in Nepal basically provided the remote villagers the ability to communicate. The villagers in the mountain region were then able to communicate with families working abroad using e-mails. Toyama, 2011 and Bon and Akkermans (2014) supports Thapa *et al*.'s (2012) argument by further noting that internet connectivity enables better communication and as a result, increased communication leads to new or further improvement in networks and information transfer.

The results from the interviews indicated that the deployment of WiFi hotspots in the various CoJ locations has enabled easier communication for the users. Respondent 4 indicated that the free CoJ WiFi hotspots improved the way he communicates and has made it easier for him to communicate with people even when he doesn't have mobile data or airtime. Respondent 4 further indicated that the WiFi hotspots had enabled him to communicate through video call, while previously he would have to by prepaid data or airtime. Respondent 5 and Respondent 6 indicated that the WiFi hotspot connect to WhatsApp allowing them to keep in touch with family and friends. Respondent 6 who is currently in Gauteng, indicated that she was able to communicate with her family back home in Limpopo. Respondent 8 and Respondent 10 indicated that they are now able to communicate with people via video calls using tools like Skype as the network is fast enough, which is something they would not do with their own prepaid data as the South African data is quite expensive.

Respondent 4: *"I have tried using it for communication when I am in the library." […] "I communicate with a video call." […] "I can video call." […] "It has changed my communication…in the old day, we would have to spend money and buy airtime just to communicate. Now we just come here and video call. You talk to me just for free, we don't spend anything. So it has changed our communication in that manner. It has improved the way we communicate because when I want to talk to you for the whole week, I couldn't because I didn't have money. But when I want to talk to you for the whole week, I can just come here and we can talk for the whole week."*

Respondent 5: *"You know sometimes the rand can be very low, you don't have data for WhatsApp. But you can keep in touch with friends and family by using the WiFi here." […] "especially on my handheld device. For WhatsApp, I do use it for social media."*

Respondent 6: *"I use it normally for….except for the internet connection, doing application and school work that we spoke about, it also connect to WhatsApp. So I can communicate with my family back in Limpopo." […] "With regards to communication, it is easier…..like it connect to WhatsApp 100%, it connect….you can connect with people via emails, WhatsApp, Facebook and all the social media. It is much convenient."*

Respondent 8: *"I do things…I can speak to people face-to-face now on video calls. Something you wouldn't do if you were using your own data. Because you would be saving data."*

Respondent 10: *"In terms of….let's say…let's say Skype, so I can talk to people sometime on Skype. Video call on WhatsApp because the network is strong enough to do that."*

The results from the respondents above supports Toyama (2011); Thapa *et al.* (2012) and Bon and Akkermans' (2014) argument that access to internet connectivity enables better communication. As presented in the findings from the respondents, the free public CoJ WiFi hotspots enabled better and easier communications for these individuals to achieve the life they have a reason to value and desire.

- **Increased knowledge**

In the 21st century's knowledge economy, knowledge is considered the most precious commodity. According to Assimakopoulos and Yan (2006) internet technologies are knowledge retrieval mechanisms that are key sources of knowledge acquisition. A study by Kroczek, van Stam and Mweetwa (2013) found that the Internet was a key tool for local farmers to gain or acquire knowledge. The results from this study exhibit the same pattern as found by Kroczek *et al*. (2013). It is apparent from this study that CoJ residents are using the WiFi hotspots to increase their knowledge capital by using their principal choice to use these free public WiFis to gain more knowledge. Respondent 3 indicated that when he failed his matric and had to rewrite some of his subjects, he used the WiFi hotspot in Lenasia to gain a better understanding of the modules that he had failed, then increasing his knowledge of those modules. Respondent 4 indicated that he likes to gain knowledge on things that he currently does not know and he uses the WiFi hotspot to acquire new general knowledge. Similar pattern was exhibited by Respondent 9, Respondent 11 and Respondent 12 who indicated that they also use the free public WiFi hotspots to increase their knowledge on things that they have a reason to value, like education, sports or even general knowledge.

Respondent 3: *"in 2014 I did my matric and I didn't pass well, so I rewrote my matric in 2016. So this WiFi helped me a lot with tutorials and the Internet. I could now understand a little much better the*

subjects that I was rewriting." […] "it improves me in the music production that I am working on. I can learn from other people's ideas and then put my own flavour."

Respondent 4: *"in my spare time I like to investigate things that I don't know in the world." […] "I have studies about the stars and some kind of….and the history using this WiFi." […] "And also to know the present things that are happening even in our country." […] "It has boosted my marks at school. Because I don't have as much books as the other students have. So I have benefited from it." […] "I use the Internet as my textbook and I also get some textbooks on the Internet. And then I download them and study." […] "I have some kind of knowledge right now that I use every day." […] "it has increased my general knowledge"*

Respondent 9: *"for instance there is an online free course. Like the one I was looking at now. For instance, this one is an online course on how to grow your Instagram following. So I do use it for stuff like that." […] "This one is a course, so I also do use it to access different online courses. Sometimes I take those classes as well." […] "It is Shopify Academy. There is a lot of short course on digital marketing. Because I am not a marketer, I had to learn when I built this e-commerce store. I realised I didn't know anything about marketing."*

Respondent 11*: "ammmm!...I am a radio personality….I am a an actor, I am a musician. So when I need more information on acting, I just go to the Internet and learn more about acting." […] "..I work for a radio station and I am a sport presenter. So if I need more information on what is happening during the week. I just come here and research before my show."*

Respondent 12: *"For school because I am studying. And I also love research, so for extra things that I like to study." […] "to gain general knowledge."*

The results from respondents above extends Assimakopoulos and Yan's (2006) argument that internet technologies are knowledge retrieval mechanisms that are key sources of knowledge acquisition by adding another context on how free public WiFi hotspots have enabled knowledge retrieval and increase individual users' knowledge.

- **Business ideas**

To get a sense of secondary development outcomes aligned to business ideas, the researcher posed the question: *have you tried using this WiFi hotspot to come up with a business idea?.* From this question, it was revealed that some respondents had used the WiFi hotspot to come up with a business idea of some sort or nurture an existing business idea that they already had. Respondent 4 indicate that he tried forex currency trading online, however he could not go ahead with this as it required him to have data even when he is at home because forex trading operates 24 hours a day. He then started using the WiFi hotspot to write home work for school students. He goes to the WiFi hotspot and gets the information that has been requested in the home work and then asks them to pay him. He indicated that he doesn't disclose when he got the information from so that they can pay him. He also indicated that he will

continue to look for other business ideas as he would like to be an entrepreneur one day. Respondent 5 also indicated that he has time and again tried forex currency trading online as well.

Respondent 4: *"I once tried to do some trading online. I didn't manage to do some trading because trading wanted me to do it even at home and at home I didn't have enough data." […] "I used to do homework for the young ones and they pay me. I come here and get the information from the Internet, do their homework and the they pay me. And when I go to them, I tell them I got this information from very far. I don't mention the place and then I get money." […] "I have tried to get some business ideas. I want to be an entrepreneur. Doing law doesn't mean that I want to be a lawyer. I want to have my own corporation or my own business in the future."*
Respondent 5: *"Yes I do I do. Time and again trading, online trading, forex. I use it."*

Respondent 6 indicated that she has registered a company with the Companies and Intellectual Property Commission (CIPC) and has since used the WiFi hotspots to operate an online marketing company. However, she had to stop as the WiFi was not always available which then impacted her business operation. Respondent 6 also indicated that while running her online marketing company, the situation was not ideal due to her limited financial resource portfolio. She indicated that she communicated mostly with clients via email, some clients would take forever to respond or respond after she has left the WiFi hotspot. This inconvenienced her business operation as she did not have internet connectivity when she was home to respond to those emails. Respondent 10 also indicated that he runs a multimedia company and uses the WiFi hotspots to run it, however he did not want to give details on his business.

Respondent 6: *"I have tried, basically I registered a CK. I was doing online marketing, and then the time the WiFi was not working, then I stopped." […] " But the thing is, when you are communicating via email it means sometimes people take time to respond, and if you have to be somewhere you will have to come back and check your emails here because not everyone will be online the time you send an email. So it is not convenient, especially if you only sell online."*
Respondent 10: *"Yes" […] "You really want to know?" […] "It is just a company….a multimedia company"*

While some respondents indicate that they had looked for a business idea using the WiFi hotspot, Respondent 11 indicate that he had not looked or come up with a business idea using the WiFi hotspots as he doesn't think business is his thing. Respondent 11 valued and dedicated most of his time to ensuring that his radio show was a success, that is what he valued and has a reason to. An interesting observation from Respondent 11 supporting Kleine's (2010:10) contention that "secondary development outcomes depend on an individual's choice as what lives they value". Respondent 11 used his choice to focus on his radio show. This shows that secondary development outcomes are determined

by an individual user's principle choice to expand the real freedoms to choose and lead the life that he has a reason to value.

Respondent 11: *"Business idea?.....No, I am not business minded (laughing). There are people who can excel into that, I don't think it is for me." […] "So for right now, I am just focused on doing my show."*

- **Increased income**

In the study "connecting South Africa: ICTs, Uneven Development and Poverty Debates", Anwar (2018) argued that the South African public telecentres are of great utility, however, they played a limited role in improving the livelihood chances, income generation and poverty reduction. Anwar (2018) further argued that studies in South African telecentres did not fully capture how these telecentres enable users to improve their livelihood chances, income generation and poverty reduction because evaluation was subjective based on the respondents' personal choices and freedoms, as argued by Sen's (2001). To get a sense of how the free public WiFi has helped users improve their income, the researcher posed the question: *has the use of this WiFi hotspot improved your income? Please explain how.*

The results from the interviews indicate that a certain number of people were using the WiFi to try to improve their income in the future. While most respondents indicated that currently they had not managed to increase their income, many of these respondents were engaging in choices that would enable them to increase their income in the future e.g. applying for jobs, studying and researching for business ideas.

Respondent one indicated that he had not used the WiFi to increase his income. Respondent 5 indicated that he had previously been disappointed by the WiFi when he was trying to submit his university application, he then got discouraged from trying to use the WiFi hotspot to increase his income due to the structural limitation (availability) that the WiFi had presented. This impacted his psychological resource (discouragement), as he got discouraged about the capability of the WiFi hotspot that he stopped trying to use the WiFi to improve his income.

Respondent 1: *"I have never tried it….only this trading thing that I am still working on. But I believe the WiFi will help me to connect and trade. When I have starting finances." […] "For now I am still down. I haven't got any income, for now I am just studying and applying for jobs."*

Respondent 5: *"Not really, like since it has disappointed me on a couple of occasions when I tried to apply for a masters program with Wits or UJ or with Unisa. So I thought if it can't do such a simple*

transaction like online application, how can I make money out of it. I gave up." […] "I got discouraged."

Respondent 6 indicated that she has previously increased her income using the WiFi hotspot. However, the structural limitation (norms of usage of time) forced her to stop trading as the library closed at 1pm on Friday meaning she did not have enough time to place her trades. She then had to stop as for her to make a decent living of trading she had to place her trades for longer even after the library had close, however, her financial resources did not at the time allow her to trade even when she is at home.

Respondent 6: *"Yes I did (make money)." […] "on a good Friday….let me just think…..it was the NonFarm payroll. I did make good money" […] "Yes, I'd come here and trade. But the problem it is on a Friday, the NonFarm Payroll starts at 12pm and then library closes at 1pm. It meant I only had 1 hour to place my trades."*

Respondent 9 indicated that even though she had not started making profit, she was starting to breakeven on her online female boutique store that she operates and using the free public WiFi hotspot. She indicated that since she started using the WiFi hotspot she no longer had to spend more on prepaid broadband data. This enabled her to improve her current income potential because her costs were reduced implying an increase in profit.

Respondent 9: *"It's slow, its slow…but its…but at least now I am at breakeven point. So at least I don't have to cough money out of my pocket."*

While the study by Anwar (2018) found that the South African public telecentres are of great utility, however, they played a limited role in improving the livelihood chances, income generation and poverty reduction. The results of this study with regard to free public WiFi hotspots seems to be contrary to Anwar's (2018) argument. The results show that there is potential to increase an individual user's income, however, the individual choice and freedom must be aligned with wanting to achieve increased income as argued by Sen (2001) and Kleine (2010) that secondary development outcomes are based on the principle choice to achieve the life an individual values and have a reason to.

- **Access to markets**

During the conversation, it emerged that some respondents have used the free public WiFi hotspot to access markets. Respondent 3 indicated that he uses Facebook to access a bigger audience or fan base for his music since he is an upcoming music producer. He is also thinking of using YouTube to publish and sell some of his music beats. Respondent 9 also indicated that when she is at the WiFi hotspot, she uses social media to advertise her business as well as access a bigger client base. She also uses social

media to get clothing items orders from clients from all over the country. She then ships the item ordered online to clients via post services.

Respondent 3: *"Yes I have a Facebook page for my beats and music. So everything that I do, if I feel like this I can give for free, I upload it on Facebook." […] "even here on YouTube; there are some guys who are selling their beats. So I am taking their ideas on how they are selling their beats."*
Respondent 9: *"I do, like for instance for my online shop…eehh!...I get a lot of my customers from digital marketing, so from social media sites. So I have to used it (to access markets). So I do go there to check if there is someone who inboxed me or someone has a question about an item or something."*

- **Time saved**

While there was not enough emphasis on how the WiFi hotspot has saved users time. Respondent 1 indicated that the local WiFi hotspot in Lenasia has saved him time and energy because he no longer must travel to bigger libraries like the Joburg City library or even go to internet Cafés to access the Internet.
Respondent 1: *"…it saves my time and it save my energy because I need not to go to Johannesburg where there is a bigger library. When I am here, I can just connect to the WiFi." […] "I don't have to go to the internet Café, I just stay here and connect with my phone. I can see this WiFi is giving more assistance to me, it is so helpful. Really it is. I am not just buying your attention (Laughing)."*

From the secondary development outcomes categories presented in the Kleine's (2010) choice framework there was no reference from the respondents on how the free public WiFi has impacted the higher job satisfaction and more voice or an opportunity to voice their feedback (be heard). The results did not come as a surprise that there was little reference to higher job satisfaction as most of the respondents were student-age group who by the time of the interview were not employed. The respondents who were part of this study were not using the WiFi hotspots to fulfil their formal work requirement. It was unlikely that we would find any reference to higher job satisfaction as most users who frequent the WiFi hotspots were unemployed, however, there was reference to using the WiFi hotspots to a get a foot in the door of the job market.

There was also no reference to more voice from the respondents, this could be because the CoJ currently has the upper hand on influencing individual agency, while individual users currently have no or little opportunity to influence the CoJ local government. The WiFi hotspot had not enabled individual agency that influences or gives feedback to government. There currently are no tools or mechanisms to enable the agency to give feedback to the structures. At the point of this research, the CoJ local government is still concerned with addressing the issue of basic internet access and connectivity. However, in the long

term, users may be able to develop more voice that can then influence structures involved in future projects, in this case, the CoJ resident will develop more opportunities for their voice to be heard.

Despite there being no reference to higher job satisfaction and more voice from the respondents, there were four new secondary development outcome categories that emerged from the interviews. The emergent categories are: access to job options, saved costs, increased opportunities and new relations. The results for this are discussed below in four new categories.

- **Access to job options**

South Africa like most developing countries, struggles with higher than ideal unemployment rates amongst the youth. Unemployment amongst the youth has major social and economic implications. According to Statistics South Africa (2018), the youth (aged 15–34) unemployment rate in South Africa is currently at 39.0% as compared to the adult unemployment rate that is currently at 17.9%. The ICT4D agenda is aligned to the United Nation's (UN) Millennium Development Goals (MDG) broad goals to address issues related to unemployment, poverty alleviation and other socio-economic ills. In an ITC4D study to understand the access of mobile-only internet users in developing countries, Gitau, Donner and Marsden (2009, 2010) identified that internet access allowed participants to successfully find jobs from online job portals like (www.ioljobs.co.za, www.gumtree.co.za and www.careerjet.co.za). To understand if the free public WiFi hotspots is addressing issues related to unemployment through improved of access to job opportunities, the researcher posed the following question: *How has the use of this WiFi hotspot changed the job opportunities available to you? Please explain.*

The results indicated that nine out of the 12 respondents had used the free public WiFi hotspots to access job options on the Internet. Respondent 1 indicated that he had applied for jobs using the free pubic WiFi hotspot and had been invited for an interview the following day. He indicated that the job opportunities are good as some of his friends who used to go the Lenasia WiFi hotspot had found jobs after applying for the jobs using the WiFi hotspot. Respondent 5 also indicated that he had been invited to a few interviews since using the WiFi hotspot to apply for jobs, he had even had to cancel some interviews as they were clashing.

Respondent 1: *"..even me, tomorrow I am going for an interview. I applied through this WiFi on Indeed job portal. I went there and applied, now they called me yesterday and they sent me an SMS that I must come for an interview by 8 o'clock in Johannesburg" […] "The job opportunities are so good. There are people who used to come here who got jobs through this WiFi. Just before you got here, there was a man who came to ask to search for this other security company, he called the name. He asked me to connect and see where this place is in Krugersdrop, he need to go there tomorrow, they need people. It makes me happy because I was able to connect and got the place, the phone number and the address of*

that place and the street. And it is not only him, there are so many people who got assistance, I am also one of those people who got assistance using this WiFi"

Respondent 5: *"Well I have been to a couple of interviews, I have had to cancel a couple of them because they were clashing. So it has improved the opportunities dramatically actually. That is why I am encouraged actually to come here."*

Respondent 6 indicated that the job options have since improved since she started using the free public WiFi as she no longer has to rely on print media to access job listing, she can now access government and private organisations' job listing online. Respondent 8 also indicated that he has been using the WiFi hotspot for applying to everything that he could, including internships in his fields of interest (engineering).

Respondent 6: *"it is easier to get jobs. With employment agencies, when they send you an email, the will say: "we are going to send you an email now respond to the email and check what needs to be sent and then send it. So that we can call you to confirm the interview". So if you do not have data, you can just come and then check the email, get everything that you need, sort everything out and then they call you back for a job interview. Much convenient. And then…..also if…..it is much beneficial, except for the security." […] "Unlike buying newspaper, unlike going to government offices to check on the papers that they put on the notice board. I can now check for jobs from private companies as well as government. Basically that changed a lot, it has improved."*

Respondent 8: *"Apply for learnerships, internships. All those things in engineering. So when I come here…I know also, I also send CVs via their computers or via my phone. Emails and everything. That what I basically use it (WiFi) for."*

The results from this study extends to Gitau, Donner and Marsden's (2009, 2010) findings that internet access allowed participants to successfully participate in finding jobs. The results from this study indicated the same trends and shows that the availability of WiFi hotspots in CoJ communities is enabling CoJ resident to access job options available online that they would not necessarily have access to without internet connectivity. This ICT4D initiative by CoJ is aligned to the United Nation's (UN) Millennium Development Goals (MDG), enabling South Africa to meet those UN MDGs.

- **Saved costs**

Anwar (2018) found that the penetration of ICTs in most areas in South Africa has also resulted in most users using a high proportion of disposable income on airtime. This is because the South Africa data pricing is skewed to disadvantage the poor. According to The World Bank (2018), more than half (55%) of the South African population are chronically poor at the national upper bound poverty line of R992 per person per month. A study by Romanosky and Chetty (2018) found that an ordinary South African

spends a median of R110 (about 8 USD) monthly on mobile costs (airtime and prepaid data). This is disposable income that could be allocated to other basic needs. From the interview, respondents kept on emphasising the point that the free public WiFi hotspots had helped them save costs. The data suggested that the free WiFi has helped CoJ residents save costs. This argument is supported by respondent one who noted that:

Respondent 1: *"Yah, I am continuing learning through WiFi. Because I know I don't have to use data and I don't have to use my money; because I don't have money (laughing)." […] "It saves me money than having to go to other libraries. I'd rather come here because I can walk here." […] "WiFi it saves me a lot as I am not worried about airtime, I just take my phone and come here. I just connect my phone. And WiFi is always responding so positively." […] "It is also cheaper….I can say it is cheapest, it is the cheapest connection. I don't spend anything." […] "I can see WiFi improves most of the lives." […] "In terms of data, data spending, airtime spending finance spending, it improves….while you didn't spend any cent, you communicate to everybody, even people abroad."*

These respondents also commented:

Respondent 4: *"Data is very expensive, and here WiFi is unlimited. And with the R16, how many megabytes will I be able to buy. It won't last, here I can download many things. I can do many researches." […] "You take out anything from your pocked, because it is free. I also mentioned that it is unlimited. So it is the best thing about this WiFi. You spend it the way you like without anyone coming to you and saying you are playing with my megabytes." […] "I don't have to spend a lot of money in buying airtime. Even though I am using a taxi, it is not a loss because the benefit outweighs the amount spend to get here."*

Respondent 6: *"Mostly is because data is expensive, very much expensive. Most of us are unemployed and when you have to apply for jobs or check your email, you need to go to the WiFi. Basically it is because of affordability of the data, since we cannot afford data, it is a good idea to come access the WiFi here." […] "Honestly, I don't remember the last time I bought data for my phone because I know there is WiFi here. Except for this week that it has been offline. I am saving money, because I am using MTN. When other people are crying that MTN is eating their data, I know I can just come here and connect."*

Respondent 7: *"This place is good, considering that we don't have to pay." […] "it is free. Data is expensive." […] "I don't have to pay and the speed is reasonable." […] "It has benefited me because I have managed to save money. Before I would have to go to internet café just to download the things I need to study. That used to cost me money and when I didn't have money, I was not able to access those PDFs. But now I am able to even access those things even when I don't have money."*

Respondent 9: *"Its saves me a lot of money because data is expensive. I used to spend about a thousand rand a month on data." […] "Now that I am using this WiFi, I don't have to buy extra…my data last me longer. So I buy less megabytes than I used to. So it makes a huge difference."*

Respondent 11: *"Because…people…especially we black people, we don't have money. So Internet is expensive…buying data is expensive. I think the introduction of WiFi made it easier for people to get into the information. Whatever information that they want."*

Respondent 12: *"Ok guy!...hawww!!...Because I am not using my own…without any cost, so I am using the government data. You see….so at least….and it is quick access…and……jah!...i can do almost anything here."*

The results from the interviews suggested that due to the high South African data cost, most of the respondents were not able to access the Internet anytime or whenever they wanted. This can be attributed to the fact that most of the respondents were student-age group with zero or limited monthly income. The respondents indicated that the free public WiFi hotspots were a great initiative as they no longer have to spend much money on data for basic internet connectivity. Respondent 6 indicated that she does not even remember the last time she purchased data as she goes to the WiFi hotspot when she needs to access something on the Internet. Respondent 9 who runs an online female boutique indicate that she used to spend about one thousand Rands a month on data, these costs have since decrease since she started using the free public WiFi hotspot. Respondent 7 indicated that he used to go to internet cafés whenever he needed something from the Internet where he had to pay for a limited internet connectivity time. This has since changed as he goes to the free public WiFi hotspot where he does not have to pay for the services. It is therefore evident from the findings that the availability of free public WiFi hotspots in the CoJ regions has helped respondents to save costs.

- **Increased opportunities (degrees of empowerment or dimensions of choice)**

In the study to assess the impact of rural telecentres, Rothenberg-Aalami and Pal (2005) found that access to ICTs opens completely new opportunities to attain higher levels of development where individuals have an opportunity and ability to live a life that they value. The results from this study suggested that the free WiFi has enabled CoJ residents to have access to more opportunities that would have not been possible had there been no free public WiFi hotspots. This sentiment is supported by Respondent 4 who said:

Respondent 4: *"I can say since I have started using this WiFi we have more opportunities; the less opportunities have changed to more." […] "like we learn for free, job seekers can look for jobs for free. They can apply for jobs for free and if they have smartphone they do everything like emailing CVs for free. Opportunities have changed. In the past, we couldn't email something on our own, we were supposed to go to the internet café and email. Now you can do it by yourself."*

Respondent 4's view was also supported by these respondents:

Respondent 6: *"The opportunities are good, depending on where you are looking for them. The opportunities are good because….like it is useless having opportunities and not having money. You will hear that there is this and this happening. Like there was communication via WhatsApp about job opportunities happening. If you don't have money and then you don't have money to buy data and all those stuff, it means you are going to get those information late. So if you come here for WiFi you will have access to those opportunities on time."*

Respondent 8: *"Yes more opportunities are being presented, I get to hear different places and see different places."*

It is therefore evident from the findings that the availability of free public WiFi hotspots in the CoJ regions has provided the residents with new opportunities that they did not have access to before they had access to internet connectivity. The results support Rothenberg-Aalami and Pal's (2005) argument that access to ICTs opens completely new opportunities to attain higher levels of development where individuals have an opportunity and ability to live a life that they value. This argument is also supported by Respondent 6 who notes that the opportunities have increase, however, the CoJ residents must choose to access these opportunities and choose where they will access them.

- **New relations**

Baron and Gomez (2013) argued that public access computing enables users to build relationships and increase their sense of belonging in new ways that were not possible or feasible before. The results suggest that free public WiFi hotspots enable users to build new social links in a form of new relationships or acquaintances. Respondent 1 supported this argument by indicting that a friend of his who used to go to the free public WiFi hotspot is now his fiancé. Respondent 6 and Respondent 11 also indicated that they have met new acquaintances by going to the free WiFi hotspot.

Respondent 1: *"….there is this friend of mine, she is on duty now. she is a domestic worker. When she knocks off work, she comes here to connect so that she can chat with her family. Her family is in Swaziland. She connects through WhatsApp and Facebook. She will tell them that I am down now and I don't have airtime now. She is now my fiancé. "*

Respondent 6: *I "know mmm!…..most people I made friend. Actually, I cannot say they are my friend, it is just people I usually see. I know I will find them here or they will find me here." […] " Yes I have met new people."*

Respondent 11: *"I made friends here (Laughing)." […] "Jah…I met a lot of people through coming here…"*

The enthusiastic perspectives participants expressed toward free public WiFi hotspots and its impact on building new social links in a form of new relationships (social resource) has lead the researcher to conclude that, for the most part, free public WiFi has a positive impact on building new relationships that enable users to expand their resource endowment and to live the life that they have a reason to value, in order words; development.

6.7 Chapter conclusion

Chapter 6 presented and discussed the findings from the empirical data. The findings were discussed based on the literature reviewed in Chapter 2 and new literature was sourced to help the researcher interpreted the findings. The research questions and objectives were presented in the beginning of the chapter to help the researcher identify the relationship between the finding and the research questions. The findings were categorised into three categories aligned to the three research objectives and the theoretical lens of the study. The next chapter synthesizes, recommends and presents a conclusions and explanation on how the research questions have been answered.

Chapter 7: Synthesis, Recommendations and Conclusions

7.1 Introduction to Chapter 7

Chapter 7 summarizes all chapters of the study and reflects on the research methodologies and processes. The chapter briefly discusses the reason why the study was conducted and the necessity for undertaking the journey. The chapter continues to ascertain whether the primary and secondary research questions have been answered by revisiting the research objectives to establish how each objective was addressed as well as whether all the research objectives were met. The chapter determines if Kleine's (2010) Choice Framework helped the researcher to understand the impact that free public WiFi hotspots have on the development of the CoJ residents. The chapter further discusses the relevance of the research with respect to its contribution to literature, contribution to theory and its contribution to practice. The limitations inherent in this study are presented and are later supported by recommendations and ideas for future research.

7.2 Research purpose and objectives

The purpose of this study was:

The purpose of this study was to explore and better understand the impact that free public WiFi hotspots have on the development of City of Johannesburg(CoJ) residents in South Africa.

The objective of this study was:

- The primary object of this study was to understand the impact, if any, of free public WiFi hotspots on the development of CoJ residents, Gauteng, South Africa, as perceived by the residents.

The secondary objectives of this study were:

- To understand who uses the free public WiFi hotspots.
- To understand what the CoJ residents use these free public WiFi hotspots for.
- To understand whether free public WiFi hotspots have impacted on the development of CoJ resident and how the impact (if any) was experienced.

The questions were derived from the purpose and the objectives of the study. The research questions and an explanation on how each research question was answered is presented below.

7.3 Answers to research questions

Over the past few decades, there has been a great focus on the role and use of ICT to advance communities and the people in those communities. ICTs are seen as a part of a wider concern around

enablers for development and it is fast becoming a point of concern for many researchers and international development agencies like the United Nations, World Bank etc. The advances in ICT4D research and the role that international development agencies are playing, mean that ICTs are now widely accepted globally as tools for fostering development. With ICTs being widely accepted, the ICT4D debate is now moving from whether ICTs do contribute to development, to focusing on how and what type of development actually takes place.

The United Nations Millenium Development Goals (MDG) adopted ICTs as one of the mechanisms that can assist the organisation's aims to end poverty and hunger, foster gender equality, universal education, child health, maternal health, combat HIV, promote environmental sustainability and foster global partnerships. The United Nations Human Rights Council (2011) has also classified internet access as a human right and tampering with people's connectivity from the Internet to be against international law. These international development agencies are influencing many national governments to adopt ICTs as a development mechanism, among those being South Africa. The external pressures put onto South Africa by international agencies has influenced the South African national and local government to adopt ICTs as a tool to enable development.

Given the pressure from international agencies and government, the South African government has since adopted ICTs as a tool to advance communities, as information is said to speed up development. In their National Integrated ICT Policy White Paper, the South African Department of Telecommunications and Postal Services (2016:1) promises to introduce "a range of interventions to ensure that everyone in South Africa, regardless of who they are, where they live or their socio-economic status can improve the quality of their lives through accessing the benefits of participating in the digital society". In the Government Gazette, 6 December 2013, the then department of communication promised to improve access to the Internet by deploying free public WiFi networks at public points of connection for citizens to access. The Department of Communications (2013:46) promised that "*free public WiFi will be made available at all public points reached by the public sector network. This will stimulate demand by allowing people to access the Internet, including government services*".

The deployment of these WiFi hotspots has led the researcher to investigate the development promised in the roll out of the free Public WiFi hotspots. To get a sense into this problem, the researcher translated the problem into this central research question: *How does the use of free public WiFi hotspots impact on the development of City of Johannesburg residents, as perceived by the residents?*. The researcher selected a few free public WiFi hotspots in the CoJ to help answer this research question. The primary research question was then broken down into three sub-question. In the next section, this study establishes how each sub-research question was addressed as well as establishing if these sub-research

questions were answered by the empirical data collected. The researcher then concludes by establishing whether the central research question was answered.

7.3.1 Research Question 1: Who are the users of the free public WiFi hotspots in the CoJ?

In terms of understanding who are the users of the free public WiFi hotspots, the study was able to answer this question by using a combination of interview questions (refer to Appendix 4) that were posed to the respondents. From the analysis of the empirical data, it emerged that frequent users of these hotspots are student-age group and unemployed youth. The findings come as no surprise due to the fact that student-age group are likely to be mostly involved in economics activities like full-time or part-time studies as well as being unemployed, given the high youth unemployment rate in South Africa. The results also found that the student-age group and unemployed youth are more likely to use the free public WiFi hotspots due to lack of alternative channels to access the Internet given that they have limited financial resources as a result of their economic activities (studying, unemployment etc.). The results also show that the South African data cost are a limitation due to high prices that most of users from this group cannot afford.

The study found that just understanding personal characteristic when identifying who the users are was insufficient. Understanding the interplay between resource-based individual agency and the structures that enable and hinder individual agency was as important. According to Kleine (2010), resource-based agency, as discussed in the choice framework, can only be realised within the confines of a given structure. The study found that personal characteristics of an individual may influence the scope and scale of the resource portfolio that an individual user has access to. The results showed that personal characteristics like gender, age and ethnicity influences individual resource endowment as some individuals have more influence than others based on their resource portfolio.

The structures which an individual operates in were found to have a direct impact on individual agency. As argued by Kleine (2010) and Ratan and Bailur (2007), we have to understand the structures in which an individual operates as social structures can constrain or enable the individual resource-based agency to make decisions. The results supported this argument; it was found that the social structures which an individual operates in can influence whether they are able to access the free public WiFi hotspots and become a user of these services. Also, structural institutions, policies, laws and locations of the hotspots influenced the ability of an individual to access the free WiFi hotspots.

While Kleine (2010) argues that resource-based agency of an individual is a shaper of, and is shaped by the structure in which it operates. The results showed that at this point in time, individual agency had limited influence on the structures that made the free public WiFi hotspots available. Rather, structures had more power when it came to influencing individual agency. The institutions involved

gave users policies and laws, decided availability and determined where the WiFi hotspots were deployed while individual agency had limited or no say concerning this. The data however suggests that in the long run, when the issue of basic internet access has been addresses, individuals are likely to influence the structures involved in the project that deployed the free public WiFi hotspots through feedback channels, sending valuable information back to the project owners and sponsors.

In conclusion, the researcher was able to establish that the frequent users of the free public WiFi hotspots was the student-age group (primary, high school, college and university students) as well as unemployed youth who are seeking for job opportunities.

7.3.2 Research Question 2: What do residents of the CoJ use these free public WiFi hotspots for?

The second research question focused on understanding what the CoJ residents use the WiFi for. To elicit answers for this question, an interview guide (refer to Appendix 4) was used to pose questions like *what do you use this WiFi hotspots for?* and *is that the only task(s) you use this WiFi hotspot for?*. It emerged from the empirical data that CoJ residents use the WiFi hotspot for various tasks, however, the top five tasks that the CoJ use the WiFi hotspot for emerged. The top five tasks mentioned by respondents as the main tasks are: educational purposes (studying, educational research etc.), job seeking, business purposes, multimedia downloads and social media. These are the top five tasks that CoJ residents value and have a reason to undertake, given that development is a choice.

The availability of the free public WiFi hotspots in various location in the CoJ regions allowed the CoJ residents to have choices. It allowed CoJ to residents to be able to make a choice of whether to use or not to use the hotspots due to availability of alternatives to access the Internet. It also emerged from the results that the availability of the WiFi hotspots allowed CoJ residents to exercise their freedom to use the WiFi hotspots on the things that the residents value and have a reason to do. The findings from the study supported Kleine's (2010) argument that the aim of development is to enable an individual to expand their freedom to choose. Sen (1999:3) further argued that development is "a process of expanding the real freedoms that people enjoy to lead the lives they have reason to value". The availability of the WiFi hotspots allowed CoJ residents a greater experience of the first development outcome which is the freedom to choose the life that they value. Given that most of the frequent users were student-age group and unemployed youth, these group gravitated mostly towards using the WiFi, to study and apply for jobs (for those who were unemployed).

The availability of the WiFi hotspots expanded the dimension of choice for the CoJ residents. Kleine (2010) analysed the dimension of choice as existence of choice, sense of choice, use of choice, achievement of choice. By the mere fact that the free WiFi was now available in their local communities,

that enabled existence of choice to residents as they could now choose how they can access internet connectivity. Now residents could choose to access the Internet via their own data or use the CoJ free WiFi hotspots. The CoJ residents were now able choose to use the WiFi hotspot or not, as they now had choices available. The CoJ ran a couple of awareness programmes to enable the sense of choice for the respondents. The users now use the choice that they had for various tasks so that they can achieve or reach the life they consider important and value. For example, one respondent indicated he had been able to secure a job interview by applying using the WiFi. In conclusion, the CoJ free public WiFi hotspot helped the CoJ respondents in expanding the real freedoms that they enjoy to lead the lives they have reason to value and the results show that the CoJ residents valued education, job seeking, business opportunities, multimedia downloads and social media and they used the free public WiFi hotspots mostly for these tasks.

7.3.3 Research Question 3: In what ways, if any, has the free public WiFi hotspots impacted the development of CoJ resident, as perceived by the residents?

The last research question focused on understanding if the free public WiFi hotpots had in any way impacted the development outcomes of the CoJ residents. To elicit answers for this question, an interview guide (refer to Appendix 4) was used to pose questions like *How do you think the use of this Free WiFi hotpots has benefited you?*. It emerged from the data that indeed the free public WiFi hotspots have positively impacted the development of CoJ residents. However, before development can be realised, the CoJ residents had to decide on whether or not to use the free WiFi hotspots as development can only be experienced after interaction with the WiFi hotspots.

Kleine (2010) argues that choice is both the aim and the principal outcome of development. She therefore argues that the principle development outcome is an individual's choice, this choice will determine the secondary development. The findings are in line with this argument as they showed that the availability of free public WiFi enabled the development of the residents by creating an environment that allowed them to make choices that will help them to achieve the life the CoJ resident values and has a reason to choose. The availability of free public WiFi meant that the CoJ residents had the ability to make a choice of whether to use or not to use the WiFi hotspots, as well as allowing them to choose what to use these WiFi hotspots for. The results show that the CoJ free public WiFi hotspots enabled resident to achieve their principle development outcome which is to make choices.

Kleine's (2010) choice framework categorised the development outcomes as principle and secondary development outcomes. The principle development outcome is the freedom of an individual to choose (choice). The results showed that the CoJ managed to achieve the principle development outcome (choice) due to the availability of free public WiFi. The secondary development outcomes are based on the principle choices that an individual makes. The secondary development outcomes are as a result of

individual users' interactions with ICTs artefact, in this study being free public WiFi hotspots. The results show that it is only through interaction with the free public WiFi hotspot that the secondary development outcomes can be realised. The results supported this argument by showing that only those who had interacted with the WiFi hotspots managed to achieve secondary development outcomes like easier communication, increased knowledge etc. The researcher used the categories provided in Kleine's (2010) Choice Framework to categorise the secondary development outcomes namely: easier communication, increased knowledge, access to markets, business ideas, increased income, more voice, time saved, higher job satisfaction. The results show that the respondents were able to achieve most of these development outcomes. Two development outcomes, more voice and higher job satisfaction were not observed in this study. The results also show that respondents only achieve the development outcomes that were aligned with what they valued. For example, a student valued getting academic information online in order to pass their exams rather than applying for jobs. Therefore, this student's development outcome would be increased knowledge. The development outcomes are based on the principle development outcome, which is choice. Based on the choices an individual makes on what to use the WiFi for, that determines the secondary development outcomes that will be achieved.

From the results, four new secondary development outcomes, not included in the Kleine's (2010) choice framework were observed. The new categories that CoJ residents managed to achieve were access to job options, saved costs, increased opportunities (degrees of empowerment or dimensions of choice) and new relations. Key to note from the findings is that the free public WiFi hotspots are impacting the CoJ residents in a positive way to achieve the freedom and to choose the life they desired and have a reason to value. In conclusion, the free WiFi hotspots have positively impacted the development of CoJ residents by enabling them to achieve primary and secondary development outcomes to live the life that they value and have a reason to choose.

7.3.4 Answering the central research question

The central research question was: *How does the use of free public WiFi hotspots impact development of City of Johannesburg residents, as perceived by the residents?*. The three sub-question discussed above helped the researcher to answer the central research question. Answering the research sub-question 1, where the researcher found out who were the users, enabled the researcher to understand how use and the development outcomes would differ. The researcher also adopted Kleine's (2010) Choice Framework for this study. The choice framework helped the researcher to understand that development is a process and every concept in development must be carefully evaluated to understand why the development outcomes vary per individual user. The qualitative interviews that the researcher conducted also enabled the researcher to gain deep insights for the central research question as he was able to further probe for detailed responses from the respondents when interesting insights came up. It is therefore evident from the results section and the section above that the researcher managed to answer the central research question by understanding who the users were, what the CoJ residents use the WiFi

hotspots for and what the development outcomes were that they managed to achieve. In conclusion, the free public WiFi hotspots deployed by the CoJ have positively impacted the development of the CoJ residents, however, the type of development impact realise by individuals was based on the choices that an individual makes when it comes to what they do with the free public WiFi hotspots.

7.4 Contribution to theory

"*Theories without data are empty; data without theories are blind*" (Harrington, 2005:5). This quote by by Harrington (2005) highlights the importance of a theory as it recommends that a study without theory makes the empirical evidence less useful. Aligning to this quote and showing the important role theory plays in the qualitative study, this study adopted Kleine's (2010) Choice Framework as a theoretical lens to guide this qualitative research enquiry. This study has made several important theoretical contributions. Firstly, this study has managed to establish that Kleine's (2010) choice framework does apply in the South African context when studying the impact that ICTs have on the development of residents. The study confirmed the core concepts in Kleine's (2014) framework are applicable to this study and that the relationships between the framework's concepts can directly be applicable in this context. This study also extended the framework by identifying additional secondary outcomes that are being realised in the South African context.

7.5 Contribution to practice

This study provided an understanding of the impact of ICT4D projects in the context of South Africa, in this case, the free public WiFi hotspots rolled out in the City of Johannesburg, on resident's development. This study will help other ICT4D researchers and practitioners to better understand how the free public WiFi hotspot initiative rolled out by the CoJ is impacting the development of residents in areas where these projects are implemented. This study will also help ICT4D project implementers to ensure that any barriers to the impact of free public WiFi hotspots on development are addressed to ensure that the city meets the residents' internet connectivity needs. The study provides direction that will guide ICT4D project implementers on how to better roll out more of the WiFi hotspots in other parts of the City of Johannesburg and South Africa as a whole. This study also gives direction to government officials on how to better address residents' development challenges through the use of ICTs. The study serves as a measure of the progress the CoJ has made when it comes to adopting and implementing ICT4D as one of their mechanisms to solve for socio-economic development challenges as recommended in the United Nation's Millenium Development Goals (MDG) and may help city officials in motivating for the expansion of this project or similar projects.

7.6 Relevance of the research methodology

The research methodology used and its relevance are addressed in this section to understand their appropriateness in enabling the researcher to reach the research objectives. The study sought to explore and better understand the impact that free public WiFi hotspots have on the development of City of Johannesburg residents, South Africa. An interpretive research paradigm was adopted to enable the researcher to gain subjective insights from respondents while respecting differences between people to grasp the subjective meaning of social action. The research conducted an explanatory research, this enabled the researcher to explain the phenomenon, why certain events took place and their outcomes. Explanatory research also enabled the researcher to establish and then explain the relationship that exists between the variables e.g. agency and structures. This study followed a qualitative research design. The data was collected using semi-structured, face-to-face interviews using open-ended questions to capture in-depth insights from the CoJ residents. The semi-structured, face-to-face interviews, where open-ended questions were posed to the respondents. This allowed the researcher to develop a relationship with each respondent, this assisted the research in making each respondent feel more comfortable to share detailed responses. The research methods applied in the Chapter Four (research design and methodology section) were relevant to this study as the researcher managed to answer the central research question and achieve the objectives of the study.

7.7 Limitations

The first limitation for this study was the fact that the researcher only collected the data from twelve respondents in the City of Johannesburg. Not all regions in the CoJ were included in the study, only respondents from region D, E, F and G were included. The focus only on four CoJ regions presented a limitation to generalisability of the findings. However, it is important to note that generalisability was not the intention of this study.

The second limitation that the researcher experienced was fluency in a language. The interviews were conducted in English, this created a limitation as some respondents were struggled to articulate some concepts in English. Some respondents would switch between English and their first language (e.g. Zulu) to better articulate themselves. This may have resulted in the intended meaning being lost in translation. This also created another limitation during transcription as the researcher had to transcribe some of the home language content had to be translated to English to enable analysis.

The third limitation of the study was that some respondents who had the desired characteristics that would have influenced the results of the study were not willing to participate in the study. Most of the possible female respondents were not willing to participate in the study. This resulted in a majority of

the respondents in the study being male. This limited this inquiry as the researcher was not able to draw in-depth insights from women. This resulted in opinions of female respondents not being fully captured in this study as only three out of the twelve respondents were female. This limitation could have been the result of the researcher being male and the women being less open to engaging with a male researcher.

The fourth limitation was that the researcher conducted most of the interviews (eight) during the week as most of the locations close early on Friday and Saturday and are completely closed on Sunday. By the researcher conducting the interviews during the week meant that possible respondents who are employed were not included in the study as they were at their respective place of work during the interviews. Therefore, the responses of respondents who are employed were not captured in the study as they were mostly at work when the data was collected.

Lastly, the WiFi hotspot at the Maboneng precinct was not working on the day the researcher went to collect data. This resulted in only twelve respondents being interviewed as compared to the fourteen respondents that were initially proposed. The responses of the two respondents from Maboneng precinct that could have influenced the results of the study were not captured.

7.8 Recommendation

This section highlights recommendations for future research based on the findings of the study and other possibilities noted by the researcher.

7.8.1 Recommendation to CoJ

The respondents who participated made recommendations to the CoJ. Respondent 6 recommended that the free public WiFi must be rolled out to a bigger audience; it must not only be limited to certain areas. She also recommended that the CoJ must hire security officers to ensure that the WiFi hotspots are safe for residents to use as there seem to be crime issues currently. She recommends:

Respondent 6: *"I would say, WiFi is a very good idea, but I would say they don't need to put it here only in Orlando, also in other locations like Pimville. Also to have security, the place need to be safe because sometime you need to check your emails and it is late. Sometimes you get a phone call that: "we are calling you for an interview and we will send you an email emails". Because we are not working, I will have to go check through the WiFi, but if we don't have WiFi in Pimville, it is sad to walk almost 14 kilometres just to check your emails."*

Respondent 4 directly recommended for more restrictions as there were users who were using the WiFi hotspots for things that he considered to be useless as they are not beneficial in any way to the development of resident. Respondent four expressed that:

Respondent 4: *"Yes there should be one (restrictions), because little kids can just come here with smartphones. There will be nothing that they will investigate or research. They will just use the WiFi for useless stuff." […] "Some naughty stuff like pornography and other things." […] "..Because some kids come here and access pornography. I have seen some kids." […] "This place should only be for matured people who know why they are here. Not only use the WiFi for naughty things."*

Respondent 8 recommended that the CoJ must increase the daily limit, currently users are limited to 300MBs per day. he recommends that the CoJ must double this so that users can be able to achieve more development outcomes. He expressed himself and said:

Respondent 8: *"Yes, even though would say they must increase it a bit. As compared to just getting it for free until your battery runs flat. Here if they can increase a bit, it is still convenient that there must be a daily limit." […] " To, 600 megabytes per day."*

Respondent 6 indicated that the current daily cap is limiting the freedom that users currently can exercise. Respondent 6 noted that the 300MBs was currently a limitation for her to achieve the life that she values. She argued that:

Respondent 6: *"I did try studying online, the problem is if you are studying online, 300 megabytes per day gets finished. And now I don't have enough data to finish. So I don't even attempt that because it is not going to be much of a gain for me because when the data depletes I will be stuck."*

It is clear from this suggestion that there is a need for improvement when it comes to the delivery of the free public WiFi hotspots. As indicated by the results of the study that the free public WiFi hotspots have a positive development outcomes. By implementing the recommendations from the respondents will enable to users to achieve more of the life they desire and value as the structures will be conducive to enabling such development outcomes.

7.8.2 Recommendation to CoJ Residents

In addition to the recommendation to the CoJ, respondent twelve had recommendation for the CoJ residents. Respondent twelve highlighted that there was unequal allocation of resources by the CoJ. She indicated that she stays in Dobsonville, however she had to travel to Joburg City library as the WiFi at her local library did not work when a person is inside the library. She recommended that CoJ residents

must unite and highlight their concerns of corruption as the greed of individuals is impacting the CoJ residents' development. She said:

Respondent 12: *"I think people have to rise up…even if people are rising up, people have to be together you know. That togetherness, that unity…even if we are saying we are unified, we are actually not. Even if we can talk about it on social media but then we are not saying anything, we are not even doing anything let me say that basically and we are not together. Because…if the majority say something and they fight for it, then it is better. But you know everyone is greedy and stuff like that, so they might be inside jobs like no….maybe something was supposed to be like this, but then because of that greediness and all that, it has to be like this. Now people are suffering because of that person who wanted to gain something for themselves."*

Respondent 12's comment suggests that the CoJ residents must unite and highlight their concerns about issues of corruption when it comes to allocation resources that are meant to benefit the broader community. This respondent displayed a sense of agency and was encouraging others to exercise their own agency. This is an indication that in future residents may start to act to influence the structures that they are subject to.

7.8.3 Recommendation for future studies

The results from the empirical data and limitations of the study highlighted several future research areas that other researcher can possibly consider. Firstly, this study only investigated free public WiFi hotspots available in region D, E, F and G of the City of Johannesburg. Further studies can therefore replicate this study by further investigating how free public WiFi impact the development of resident in other metropolitans like City of Ekurhuleni, City of Cape Town, City of Tshwane etc.

Secondly, a comparative study between various metropolitan cities for different provinces can also be conducted to explore the degree of impact the free WiFi hotspots has on the development of residents. This study can present the degree of similarities or differences of impact from each metropolitan.

Thirdly, the researcher only managed to interview respondents of African ethnicity as the locations that were selected for the study were mostly occupied by respondents of African ethnicity on the days of the interviews. As according to Klein's (2010) Choice Framework, personal characteristics like gender, age, ethnicity influence an individual resource endowment. Another study can be conducted to explore how the free public WiFi impacts the development outcomes of other ethnicities, as development is a choice. It would be interesting to see if the development choices made by other ethnicities differ from those of African ethnicity.

Lastly, the study captured mostly the responses of men (nine), with only three female respondents. The study also captured the responses of student-age group who were mostly studying or unemployed. Future responses can try to capture the responses of women as well as another age group (e.g. middle aged or senior citizens) to understand the type of development impact that would be experience by them from the free public WiFi hotspots.

7.9 Research conclusion

In conclusion, the study highlighted that the availability of free public WiFi hotspots in various locations in the CoJ regions has enabled residents' freedom to choose the life that they value and have a reason to. The results showed that development can only be realised when an individual chose to interact with the technology in place, without using the free public WiFi hotspots, residents will not be able to realise development outcomes offered by the WiFi hotspots. An individual user has to firstly exercise their freedom and choose to use the available technology, in this case, free public WiFi hotspots. The study also found that freedom to choose, in this study operationalised as resource-based individual agency can only be experienced within the confines of structures. The social structures available to the individual can enable or hinder the freedom that an individual is able to exercise when it comes to choosing the life that they value. The results also showed that the structures and individual agency can influence the choices available to an individual. The results showed that development is a process of expanding the real freedoms that people enjoy to lead the lives they have reason to value. This was evident in the development outcome experienced by respondents. Respondents only chose to use the free public WiFi for to achieve the life that they value and have a reason to. In conclusion, the availability of free public WiFi hotspots in various locations in the CoJ region does positively impact the development of residents, keeping in mind that development is a choice. Only those who chose to use the free public WiFi hotspots will be able to achieve the development outcomes that they value and have a reason to pursue, given the confines of their social structures. The secondary development outcomes are self-defined based on the principle development outcome.

7.10 Chapter conclusion

A conclusion to the entire study was provided in this chapter. The chapter firstly recapped the research objectives. The chapter followed by presenting answers to the research questions and a discussion on how each question was answered. The chapter then presented the contribution the study made to theory and to practice. A discussion on the relevance of the research methodology applied was presented. The researcher then presented limitations that were experienced during the completion of the study. Recommendations derived from the findings were presented and discussed.

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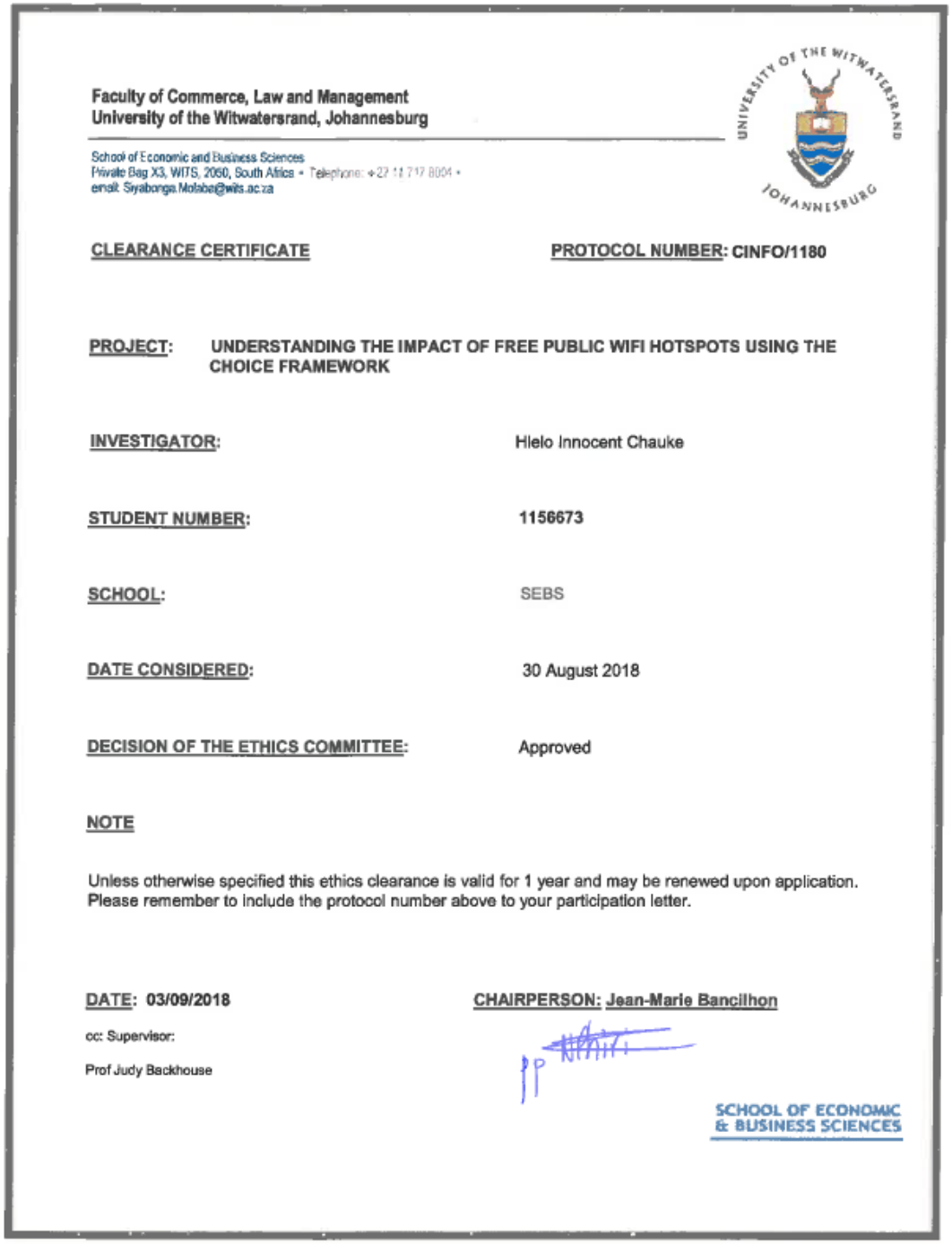
Appendix

Appendix 1. Wits Ethics Clearance Certificate



Faculty of Commerce, Law and Management
University of the Witwatersrand, Johannesburg

School of Economic and Business Sciences
Private Bag X3, WITS, 2050, South Africa • Telephone: +27 11 717 8004 •
email: Siyabonga.Molabe@wits.ac.za

UNIVERSITY OF THE WITWATERSRAND JOHANNESBURG

CLEARANCE CERTIFICATE **PROTOCOL NUMBER: CINFO/1180**

PROJECT: **UNDERSTANDING THE IMPACT OF FREE PUBLIC WIFI HOTSPOTS USING THE CHOICE FRAMEWORK**

INVESTIGATOR: Hlelo Innocent Chauke

STUDENT NUMBER: **1156673**

SCHOOL: SEBS

DATE CONSIDERED: 30 August 2018

DECISION OF THE ETHICS COMMITTEE: Approved

NOTE

Unless otherwise specified this ethics clearance is valid for 1 year and may be renewed upon application.
Please remember to include the protocol number above to your participation letter.

DATE: 03/09/2018 **CHAIRPERSON: Jean-Marie Bancilhon**

cc: Supervisor:

Prof Judy Backhouse

SCHOOL OF ECONOMIC & BUSINESS SCIENCES

Appendix 2. Information Sheet for Respondents

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Private Bag 3 Wits, 2050
Fax: 0270865536132
Tel: 02711 7178005

Date: 20 August 2018

Dear Sir/Madam

My name is Hlelo Chauke; I am currently registered for a Masters of Commerce (MCom) degree in Information Systems at the University of the Witwatersrand (Wits), Johannesburg, South Africa.

I am writing this letter to ask you to participate in my research study titled "**Understanding the impact of free public WiFi hotspots using the Choice Framework**". The purpose of this study is to understand how the use of free public WiFi has impacted the development of City of Johannesburg residents.

The collection of data from City of Johannesburg residents in region D, E, F and G is a prerequisite for the completion of my masters empirical research project (dissertation). You are therefore invited to take part in this study as your perspective and understanding as an end user will help us gain insights on the impact that the City of Johannesburg free WiFi hotspots have on the development of the CoJ residents. Your high-level knowledge and understanding the system and capabilities makes you best positioned to participate in the study.

Participation to this study will be voluntary and confidential. This research study is anonymous and as thus, you are not requested to provide the researcher with your name, your physical address or other personal identification information. The completion of the interview is estimated to take between 15 to 30 minutes at most. Please note that this interview is voluntary and should you wish to stop there won't be any repercussions. The data that will be collected from this survey will only be used for purposes of the research study, which will help me as a researcher and an academic to gain a greater understanding on the research topic stated above. The data that will be collected will be securely stored at Wits University and will not be shared with any third party. The results of this study will be reported by Wits University in a form of a dissertation. If the research qualifies for publication, the results may also be published in

conference papers and academic journals. The research study findings will be made available to your request.

This study is being conducted under the supervision of Professor Judy Backhouse, who can be contacted on: Judy.Backhouse@wits.ac.za or 0117178161.

All queries can be directed to Hlelo Chauke, who can be contacted on cell: 081 740 0142 or email: hlelochauke@gmail.com.

Thank you for considering participating in this study.

(Researcher's Signature)

Kind regards
Hlelo Chauke
Masters Student

Appendix 3. Information Sheet for Location Manager

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Private Bag 3 Wits, 2050
Fax: 0270865536132
Tel: 02711 7178005

Date: 20 August 2018

Dear Sir/Madam

My name is Hlelo Chauke; I am currently registered for a Masters of Commerce (MCom) degree in Information Systems with the School of Economics and Business Sciences at the University of the Witwatersrand (Wits), Johannesburg.

I am writing this letter to request permission to collect data from your premises. I am currently conducting a research study titled "**Understanding the Impact of Free public WiFi hotspots using the Choice Framework"** under the supervision of Professor Judy Backhouse from Wits University, Johannesburg. The study aims to collect data from public libraries, community halls and one precinct found in the City of Johannesburg region D, E, F and G in the. Two respondents will be interviewed per location. Below are the locations that have been identified by the researcher to collect data from:

Regional Location	City of Johannesburg Region	Location	Number of Interviews
Soweto	Region D	Orlando East Public Library	2
		Orlando East Community Hall	2
Sandton	Region E	Sandton Library	2
Johannesburg	Region F	Johannesburg City Library	2
		Maboneng Precinct	2
Johannesburg South	Region G	Lenasia Ext 1 Library	2
		Lenasia Ext 1 Community Hall	2

The collection of data from region D, E, F and G is a prerequisite for the completion of my masters empirical research project (dissertation). Using your location for this study will help the researcher in understanding and gaining deep insights on the impact that free public WiFi hotspots has on development of the CoJ residents.

Participation to this study will be voluntary and confidential. This research study is anonymous and as thus, respondents will not be requested to provide the researcher with their name, physical address or other personal identification information. The completion of the interview is estimated to take between 15 to 30 minutes at most. The interview will be voluntary and should the respondent wish to stop there won't be any repercussions. The data that will be collected from this survey will only be used for purposes of the research study, which will help the researcher to gain a deeper understanding on the research topic stated above. The data that will be collected will be securely stored at Wits University and will not be shared with any third party. The results of this study will be reported by Wits University in a form of a dissertation. If the research qualifies for publication, the results may be also published on conference papers and academic journals. The research study findings will be made available to participants on request.

This study is conducted under the supervision of Professor Judy Backhouse, who can be contacted on: Judy.Backhouse@wits.ac.za or 0117178161. All queries can be directed to Hlelo Chauke, please feel free to contact me on 081 740 0142 or email hlelochauke@gmail.com.

Please consent to granting permission to Mr. Hlelo Innocent Chauke, student no 1156673 to collect information from your premised subject to obtaining ethical clearance to conduct research from the Ethics Committee of the University of the Witwatersrand, Johannesburg and by abiding to its terms.

Can you please sign this letter and send me a letter with the official letterhead of your organisation stating that permission has been granted to conduct research at your premises.

Name: _____
Signature: _____
Signed at _____
On the_____ Day of _____ 20_____

Appendix 4. Research Instrument – Interview Guide

Hi there, how are you?

Do you use the City of Johannesburg free public WiFi hotspots?

<<If No, End the conversation>>

<<If Yes>>

Can I have some time to chat with you about the research that I am currently conducting?

<<If No, End the conversation>>

<<If Yes>>

Thank you for giving me some of your time and for your willingness to participate in the study. My Name is Hlelo Chauke, Masters of Commerce in Information Systems at Wits University. This is actually not an interview but just casual conversation around your experiences. Please share your perspective as much as you would like to tell me. In cases where I need you to elaborate, I will interrupt you and ask more question, please don't panic. Please note that this is your story, so there will be no right or wrong answers. Everything you share will remain confidential and your identity will not be compromised.

Understanding Who are The Users (Agency)?
1. I would like to understand more on why do you use this WiFi hotspot? 2. How do you know how to use this WiFi hotspot and Do you feel confident on how to use this WiFi hotspot? Probe: Where did you learn about WiFi hotspots? : Does a person need training to be able to Connect or they can teach themselves on how to connect? *<<If Yes>>* Please explain how did you get so confident? *<<If No>>* Why are you not so confident with using this WiFi hotspot? 3. Is this WiFi hotspot conveniently located for you? why do you think so? Please explain Probe: Where do you currently reside? : How close is this WiFi hotspot to where you stay? : How easy is it for you to get to this WiFi hotspot? : How do you usually get here? : Does it cost you anything to get here? 4. What do you need to connect to this WiFi hotspot? Probe: what device do you use to connect to the WiFi hotspot? : Is that there only device you use to connect to the WiFi hospot? : What other devices do you use to connect to the Internet?

: What is your preferred was you connect and why?

5. Is there any age restriction on who can access this WiFi hotspot or everyone is welcome?
6. What kind of people usually frequent this place?
7. Do you think this WiFi hotspot is user friendly for people with any disabilities? Why do you this so

Understanding Structures

1. How did you find out about the free WiFi hotspot here?

   Probe: Did you get trained on how to use this WiFi hotspot, were there any advertisement, Word of mouth?
2. Why do you use the WiFi hotspot here?
3. Are there any other WiFi hotspots that you use?

   <<If yes>> where are the other WiFi hotspots located?

   <<If not>> Why do you only use this WiFi hotspot?
4. What other people do you know who use this WiFi hotspot?
5. What do other people say about this WiFi hotshot?
6. What makes this WiFi hotspot a good way to access the Internet?
7. Are there any limitation on what you can do with this free WiFi hotspot?

   Probe: Do you know how much MBs/Gigs available to you per day?

   : How do you feel about the 300MB limit per day?

   : Is the WiFi hotspot available every day?

   : Are there days when this WiFi hotspot is not working?What do you do then?

   : is there any time limit on how long you can stay here?

   : Can you just sit anywhere or there is only allocated place where you are supposed to sit?

Understanding the Type of Use

1. What do you use this WiFi hotspots for?
2. Is that the only task(s) you use this WiFi hotspot for?

3. Have you tried to use it for something else ?
4. Why did you? **Or** Why have you not tried?
5. How often do you use this WiFi hotspot for the mentioned task?

Understanding the Benefits

1. How do you think the use of this Free WiFi hotpots has benefited you?

   Probe: What are some of the benefits that you have realised from using this WiFi hotspot?
2. How has the use of this WiFi hotspot changed your communication?
3. How has this WiFi hotspot changed the information you have access to?
4. Has the use of this Wifi hotspot change the opportunities that you have access to? What kind of opportunities has it opened up?
5. Has the use of this WiFi hotspot improved your income? Please explain how
6. How has the use of this WiFi hotspot changed the job opportunities available to you? Please explain

Thank you for your time and your willingness to participate.

Appendix 5. City of Johannesburg Research Clearance



City of Johannesburg
Community Development: Library and Information Services

Assistant Director: Region D
1 Koma Road
Jabulani Civic Centre
Jabulani

Tel + 27 (0) 11 986 0154
Fax + 27(0) 11 930 3536
Cell 082 857 2628
lolom@joburg.org.za

Mr. Hlelo Chauke

Student: 1156673

Flat 307, Royal Place

Eloff Street

Johannesburg

13 August 2018

CONSENT TO CONDUCT RESEARCH AT ORLANDO EAST LIBRARY AND COMMUNITY HALL

We hereby support Mr. Hlelo Chauke's application, a Masters of Commerce in Information Systems by Coursework student from the University of the Witwatersrand, to conduct interviews at the Orlando East Library and Orlando East Community Hall after obtaining his ethical clearance from the Ethics Committee of the University of the Witwatersrand.

Permission is granted to Mr. Hlelo Chauke subject to him obtaining ethical clearance to conduct research from the Ethics Committee of the University of the Witwatersrand, Johannesburg and by abiding to its terms.

I have been informed of Mr. Hlelo Chauke's line of research and of the nature of the interaction that will happen between Mr. Chauke and Orlando East library and community hall users. Only two respondents will be interviewed per locations.

For any question, please contact Ms. Masetlha on Cell: 082 857 2628 or email: lolom@joburg.org.za .

Name: _Elise Salome (Lolo) Masetlha_____

Signature: _____

Signed at __Jabulani Civic Centre , Soweto_____

On the_____14th _____ Day of ___August _____ 2018____

City of Johannesburg
Community Development: Library and Information Services

eLearning and Library Applications (ELA)
22 Solomon Street
Braamfontein
2091

Private Bag X 106
Braamfontein
2017

Tel + 27 (0) 11 226 0923
Fax + 27(0) 11 226 0973
Cell 083 288 8997
bonganitsh@joburg.org.za

a world class African city

Mr. Hlelo Chauke

Student: 1156673

Flat 307, Royal Place

Eloff Street

Johannesburg

20 August 2018

CONSENT TO CONDUCT RESEARCH AT CITY OF JOHANNESBURG LIBRARIES

We hereby support Mr. Hlelo Chauke's application, a Masters of Commerce in Information Systems by Coursework student from the University of the Witwatersrand, to conduct interviews at the City of Johannesburg Libraries after obtaining his ethical clearance from the Ethics Committee of the University of the Witwatersrand.

Permission is granted to Mr. Hlelo Chauke subject to him obtaining ethical clearance to conduct research from the Ethics Committee of the University of the Witwatersrand, Johannesburg and by abiding to its terms.

I have been informed of Mr. Hlelo Chauke's line of research and of the nature of the interaction that will happen between Mr. Hlelo Chauke and City of Johannesburg Library users. Only two respondents will be interviewed per locations.

For any question, please contact Me. Bongani Nkosi on Cell: 083 288 8997 or email: bonganitsh@joburg.org.za

Name: BM Tshabalala

Signature: Btshabalala

Signed at Johannesburg

On the 21st Day of August 2018