

**A MATRIX FOR ASSESSING AND EVALUATING THE IMPACT OF MOBILE
PHONES FOR DEVELOPMENT IN RURAL COMMUNITIES: A CASE STUDY OF
PHAKE REBONE COMMUNITY**

by

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DECLARATION

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I declare that A MATRIX FOR ASSESSING AND EVALUATING THE IMPACT OF MOBILE PHONES FOR DEVELOPMENT IN RURAL COMMUNITIES: A CASE STUDY OF PHAKE REBONE COMMUNITY is my own work and that all the sources that I have quoted have been indicated and acknowledged by means of complete references.



Signature

(FS Modiba)

22/12/2015

Date

DEDICATION

This study is dedicated to my mother, Johanna Modiba, for her courage and love of education that despite her being uneducated wanted us to be educated. Thank you mother for setting such a high standard regardless of your circumstances.

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ABSTRACT

Rural communities have been disconnected from the global world in the past due to lack of infrastructure that rendered connectivity a challenge for them. Recent developments in information and communication technology (ICT) have led to improved connectivity in these areas. As a result, mobile phones have become ubiquitous in these rural communities. A matrix was proposed in this study in order to evaluate and assess the impact of mobile devices on development of the rural communities.

Existing measurement tools have not yet explored how the usages of mobile phones and other ICTs are impacting the lives of people in rural communities of South Africa. The aim of this study was to understand the existing criteria used to measure the impact of ICTs in rural communities. This was to be achieved by focusing on the use of mobile phones in the community of Phake Rebone, taking into account different users. Once this was established, the study had a primary objective to design a matrix that would assist in evaluating and assessing the impact of a mobile phone in social activities such as learning, business and governance.

This was achieved by using a case study method, employing qualitative and quantitative research methods. Cases within a case study were used to uncover how the core groups within the community used the mobile phone. A mixed method approach was used in data gathering and analysis to enable the researcher to identify usages and challenges related to the mobile phones. Data was collected from 401 participants and was analysed through the computer-aided tools such GoogleDocs and Microsoft Excel.

The findings of the study showed a greater usage of the mobile phone. The literature findings of the use of the mobile phone for basic communication as well as growing adoption of applications such as social media and Internet were confirmed. The use in community related activities and work purposes that impacted the community members were minimal. The need of training to gain knowledge on how to use the device more effectively was established. The proposed matrix therefore seemed

relevant not only to measure impact but also to highlight the areas in which the community members can be trained on.

The noted usage trends and needs by the community were then used to formulate indicators that could be used for the matrix. The indicators were then used to develop a matrix that could be used by community members and other interested parties to measure the impact of mobile phone on development of the users. The results of the matrix were also proved to be efficient in assisting individual users in recording the skills acquired through the use of the mobile phone. The matrix can be used in consultation with the guidelines that were formulated to ensure that each user, particularly from rural communities, benefits from such an evaluation tool.

Key words: Information communication technologies (ICTs); mobile phones; impact assessment; evaluation; development; rural communities; matrix

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LIST OF ACRONYMS

ALPS	Action Aid Accountability; Learning and Planning Systems
ASGISA	Accelerated Shared Growth Initiative of South Africa
BBM	Blackberry Messaging
C4D	Communication for Development
CPF –	Community Policing Forum
CRDP	Comprehensive Rural Development Programme
DRDLR	Department of Rural Development and Land Reform
DFID	Department for International Development
DTI	Department of Trade and Industry
EC –	European Commission
EMR	Electronic Management Record
FTL –	Fixed Telephone Lines
GEAR	Growth Employment and Redistribution
GDP –	Gross Domestic Product
GEM	Gender Evaluation Methodology
GSMA	Groupe Speciale Mobile Association
GTZ	German Technical Corporation
HDI	Human Development Index
ICASA	Independent Communications Authority of South Africa
ICTs –	Information and Communication Technologies
ICT4D –	Information and Communication Technologies for Development
IFC	International Finance Corporation
IFRC	International Federation of Red Cross and Red Crescent Societies
IICD	International Institute for Communication and Development
IM	Instant Messaging
ISRDS	Integrated Sustainable Rural Development Strategy
ITU -	International Telecommunication Union
m-App –	mobile Application
MDGs –	Millennium Development Goals
MLF	Mobile Learning Framework
MNO –	mobile network operator
MPCC –	Multipurpose Community Centres

MSC	Most Significant Changes
NDP	National Development Plan
PCM	Please Call Me
PCMB	Please Call Me Back
PDA	Personal Digital Assistance
PHBC –	Phake Home-Based Care
RDP	Reconstruction and Development Programme
RSA	Republic of South Africa
SIM –	Subscriber Identifier Module
SL	Sustainable Livelihoods
SMMEs –	Small Medium and Micro Enterprises
SNA	Social Network Analysis
SNS –	Social Networking Service
UN –	United Nations
UNCDF	United Nations Capital Development Fund
UNDP	United Nations Development Programme
USSD	Unstructured Supplementary Service Delivery

CHAPTER ONE

1. INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

This study was undertaken to investigate the different usages of mobile phones and develop a matrix to assess and evaluate its impact on various groups in the community of Phake Rebone in the Mpumalanga Province, South Africa. The community of Phake Rebone was selected as it is representative of rural communities. The community is made up of young and elderly people who are involved in activities such as schooling, work and volunteering in community projects. The wider usage of mobile phones gives an impression that these devices are effective and they empower the users by contributing immensely to human, social and economic development. This study investigated the uses and effectiveness of mobile phones in rural areas.

Development has various components attached to it and these may be human, economic, infrastructure, community and politics (Asaba et al 2006: 144, Ngwenyama et al 2006: 3, South Africa 2000: 19). Such components that are linked to development have led to limited definitions of development; and in many publications development is mainly synonymous with the aforementioned components (Mahembe & Odhiambo 2014: 10, Moyo 2013: 5397, World Bank 2006: 12). The United Nations Development Program, in efforts to measure different countries' development, created the Human Development Index (HDI) in order to be able to assess human development. The HDI emphasises that peoples' capabilities are the most important criteria to measure a country's development¹. They are measured by assessing people's lifespan, including good health, knowledge and having a decent standard of living (UNDP 2009: 4).

For purposes of this study, development referred to a process of improving social, economic, technological and/or personal conditions. Emphasis was on human development, focusing on how mobile phones have impacted on the community at

¹ <http://hdr.undp.org/en/faq-page/human-development-index-hdi#t292n36>

large. The research problem investigated was thus to understand the effectiveness of mobile phones and if a measurement tool could be developed to measure their impact. This was done by identifying indicators and markers that could be used to develop a matrix that would measure the effectiveness of mobile phones in a rural community such as Phake Rebone. A matrix is a measurement tool developed to measure access and the effectiveness of mobile phones in the rural community of Phake Rebone. Community members can use this tool to analyse how they are using mobile phones to their advantage. It assists in identifying the skills being accumulated in the process of performing different activities.

Mobile phones are a communication tool that enables people to contact each other even in remote areas. People can contact each other whether they are in the same area or in different parts of the world. Rural, urban and suburban areas of all countries now use the device. The importance of mobile phones in rural communities is emphasised by Berger and Sinha (2012: 13), who state that mobile phones have played a large role in enabling people in rural and urban areas to communicate more easily. As mobile phones grew popular, their usage extended to facilitating payments and accessing other web based services (Eijkman et al 2009: 220, Kleine & Unwin 2009: 1047). Mobile phones are surpassing fixed telephone lines (FTL) in Africa in terms of services that are being offered depending on the user's needs and requirements (Frempong & Braimah 2006: 30, Wafula-Kwake & Ocholla 2007: 38). Their high growth especially in rural communities is due to the fact that they require minimal infrastructure compared to FTL. These devices do not only benefit the individual community members, but also assist other key aspects of the community such as businesses, schools, and other community forums. The International Telecommunication Union (ITU) (2013: 1) submits that with such a computing power available to all, it is imperative to harness this technology for use in health, education, agriculture, banking and all other aspects that would lead to sustainable development.

It is in this light that this study investigated the overall usages of the mobile phone in the community using case studies of education, community policing forums (CPF), businesses and health services as will be explained in the background section. An overview of the use of various information and communication technologies (ICTs) in the areas of business, education, health and other community related aspects are

discussed throughout the study to demonstrate their role in the lives of community members.

The study examined if ICTs in communities could use two different approaches: ICT for development (ICT4D) or ICT in development. ICT4D refers to the development initiatives which often target communities that did not have access to most of the ICTs such as computers, educational and socio-economic applications (Dodson et al 2013: 19). ICTs are given to the communities in an attempt to empower them in areas of poverty alleviation, education, health and governance (UNDP 2001: 1). ICTs in development refers to ICTs penetrating or being used in developing countries (Brown & Grant 2010: 98). ICT devices are not provided by organisations but the users within communities acquire them for their own usages. These are devices such as telephones, mobile phones and computers. Different researchers and scholars either follow the ICT4D, ICT in Development, or both approaches. The aim of this research was not to take an information and communication technology for development (ICT4D) approach of how ICTs can be introduced in rural communities or assess ICT related initiatives aimed at empowering the communities. The study took the ICT in development approach in order to understand how ICTs have penetrated rural communities and how people are using the technology. Thus a matrix becomes key in recording the different usages because when it is understood on how this device is used it becomes clear on how the users can further be supported to maximise their use to reach the perceived benefits. The ICT4D literature was consulted to understand the perceived benefits of ICTs and to also identify the gaps in terms of measurement in such initiatives. As Avgerou (2009: 8) points out, the benefits of ICTs should not be assumed, but should rather be understood from a practical perspective so as to see the effected impact. Moreover, to alleviate poverty, implicit socio-economic steps should be taken using ICTs to reach the desired transformation. Inasmuch as challenges have been noted on the lack of success in some ICT4D initiatives (Esselaar & Gillwald 2007: 26, Gxulwana 2010: 22, Muller 2009: 35), the researcher explored the proactive ability taken by communities that have challenges of poverty and illiteracy to adopt the mobile phone technology. In the words of Krauss, (2009: 14):

“(M)any development and upliftment programmes fail because poverty, alienation and hopelessness are so deeply rooted in a community that it is

impossible for the people to believe that a hopeful future or anything better is possible”.

In such cases described by Krauss, the ICT4D programmes aimed at poverty-stricken communities will not improve their conditions, as they will not be remedying actual problems.

1.2 BACKGROUND TO THE RESEARCH TOPIC

The penetration of mobile phones into communities, including rural areas in South Africa, is growing at a fast pace. The level of adoption of such devices is at different levels with regards to types of mobile phones acquired and how they are used. The usage trends tend to be different between the adult and youth groups as well as in rural and urban areas. Beger and Shinha (2012: 14) state that the development of improved ICT infrastructure has led to the youth owning mobile phones and being connected. In Vermeulen's (2011: 1) review of the mobile phone service, providers' market shares illustrate that rural users' statistics are lower than those of urban users. Usage was not only limited to voice calls but has been extended to social networking services (SNSs) such as Mxit, Twitter and Facebook, Internet surfing and mobile banking. Mxit is a South African mobile application designed for social networking and playing used primarily by teenagers. Mxit offers a virtual chatting platform and opportunity for users to transact with different organisations, offering applications on the platform that can transact with different applications (Mxit 2014: 1). Other organisations have uploaded educational content on mathematics to facilitate learning through a tutor system (Butgereit et al 2010: 1). Mxit is popular amongst teenagers in South Africa and is also used in India, Indonesia and Nigeria. This application is cheaper than other texting services as users pay less than one cent to access the chatting services and use virtual money called *moola* within the platform to purchase additional services (Butgereit et al 2010: 2, Mxit 2014: 1). Facebook and Twitter are international social networking applications that can be accessed by either a portable computer (PC) or a mobile phone. The youth, adults and corporate organisations mostly use these applications. Recent trends show that users are now accessing these applications more on their mobile devices than PC (Pew Research Center 2014: 6). Available statistics show that access to Twitter on mobile phones is recorded at 78 per

cent². It has been reported that close to 8 million South Africans access Internet on their mobile phones, from “sometimes to regularly”³. The 2011 general access to Internet using mobile phones was at 2,5 million (STATSSA 2012c: 102). The use of services such as Mxit was reported to be lower in rural areas, although the authors expressed faith in seeing this change in the near future (Beger & Sinha 2012: 18).

1.2.1 Community profiling

In conducting this study in the community of Phake Rebone, it was important to understand what a community meant in the context of this research and to create a profile of the community. According to Hawtin and Percy-Smith (2007: 38), it is quite problematic to define the concept of a community as it has different meanings attached to it. Despite the challenges embedded in defining a community, it is argued that the concept itself is subjective rather than objective (EC 2008: 84). In an attempt to overcome the challenge of defining the concept of community, some authors have identified elements and characteristics which help in describing ‘community’ (Hawtin & Percy-Smith 2007: 6, EC 2008: 80). This study did not attempt to define the concept, but rather defined what it meant in relation to this research. Community refers to the people who reside in the area, the people offering services to the targeted community, for example, teachers who might be coming from different areas, and people involved in providing skills for the targeted community. In short, the community referred to all the key players (stakeholders) in the targeted village. Hawtin and Percy-Smith (2007: 39) further advise that it is important to include external people who are not residing in the village but who have an interest in the targeted area. The extensive overview of the targeted community will be discussed in Chapter Four.

The study adopted some of the elements suggested by Hawtin and Percy-Smith in order to understand all-important aspects of the community. The profile of this community was informed by Hawtin and Percy-Smith’s description of a community profile, which comprise the following elements (Hawtin & Percy-Smith 2007: 6):

² More information on Twitter statistics: <https://about.twitter.com/company> - date accessed: 10/10/2014

³ Mobile pushes Internet to the masses, May 2012: <http://www.worldwideworx.com/mobile-pushes-internet-to-the-masses/> - date accessed 01/02/2013

- the area as a place to live (resources such as clinics);
- the social community;
- its economic activities;
- its political nature;
- its personal space in relation to the degree of attachment by its residents; and
- the area as part of its city, that is, its local identity.

Some of these elements were used to describe the community of Phake Rebone. The community of Phake Rebone was described based on the geographical area, its social community (education, community policing forums), economic activities (businesses and services used by the community), political structure (the democratic constituents leading the community), and gender. These elements were adopted because they are the determining factors on whether communities are able to use resources they have in order to live better. For example, Davids et al (2012: 41) states that in South Africa, gender and whether a person is living in rural or urban areas determines his/her chances of living in poverty. Knowing these elements enabled the researcher to understand the area where the targeted population live, what they do for a living, what they cherish about their community, who their leaders are, the level of involvement by gender, and what they would like to see the community achieving. This shed light on issues that the matrix needed to incorporate.

1.2.2 Participatory development

Participatory development is an approach that encourages community members to partake in internal and external initiatives introduced in their communities that are aimed at improving their livelihoods. Getahum (2008a: 117) states that communities are able to break the poverty and unemployment trap when they participate in development initiatives. The community should participate in decision-making, implementation and evaluation of the solutions that are aimed at alleviating poverty (Croal & Darou 2002: 104). This approach fosters empowerment of the community members, and can enhance sustainability of development initiatives (Chirenje et al 2013: 11). Through empowerment communities are then able to internally establish and influence their own local initiatives. The involvement of the community members therefore ensures that they can influence the development initiatives which will make

them more favourable by the whole community. The approach can be useful with ICT-based initiatives where, in most cases, the projects do not succeed. The failure is in most cases due to a top-down approach used when giving the resources to communities. For example, the study of Ahsan (2008: 3) shows how the multipurpose community centres (MPCCs) failed to address the needs of the marginalised women in India and Uganda. The design of the services was not in line with the needs of the targeted group, therefore leading to the intended beneficiaries becoming objects of the initiative rather than active participants. Contrary to the MPCCs, mobile phones are a development tool that most communities took an initiative to use and the usage still grows (UN 2013: 4). According to Rogers et al (2008: 52), modern technology at times fails to achieve its intended purpose because the community often does not know how to optimally utilise these technologies. The participatory approach further complements ICTs that members of the community have already acquired and are using.

The Sustainable Livelihoods (SL) framework was developed in response to the problems of poverty in rural communities. This is a framework that views people as vulnerable beings, who, in most cases, live in environments which have resources that can enable them to reduce poverty (Carr 2013: 79) . The framework was aimed at assisting people to use the available resources to help them get out of poverty (Duncombe 2007: 83). Moreover, this is not done in vacuum, but through the community's involvement and participation. This supports the earlier statements of allowing people to partake in activities that will benefit them as well as enable sustainability of poverty alleviation. Limited participation by community members may lead to unsustainability where the initiated projects fail and the cycle of poverty continues. The Sustainable Livelihoods framework does not only help in integrating the poor into development efforts, but has been used to evaluate ICTs' impact on poverty. According to Duncombe (2007: 96), this framework enables investigation of ICTs and poverty reduction by contextualising the analysis with the social, political and economic relations. The assets that make up the livelihood framework are discussed in detail in Chapter Two. Although this study was not focusing on any initiatives that were introduced to the researched community, it showed participation of the community members in acquiring and using the mobile phone to reach certain

development goals based on their needs. Thus, the pace of using and learning new things on the mobile phone was determined by them (Sharples et al 2007: 15).

1.2.3 ICTs and development

Research on impacts of ICTs normally takes three approaches and these were briefly introduced in the introduction section. They are: 1) ICT for development (ICT4D); 2) ICT in development; and 3) use of both approaches (Brown & Grant 2010: 103). In addition, emphasis is made on understanding that the two approaches somehow merge and researchers when taking a different approach should fully recognise the convergence in order to increase the value and relevance of ICTs towards development (Brown & Grant 2010: 93). This study recognised and acknowledged the duality that exists between the two approaches. In trying to understand the impact of ICTs, Brown and Grant reviewed a number of articles. In their review, they found out that many scholarly articles were reporting mostly on ICTs in development. They argue that ICT4D should be well represented to show the impact of ICTs on development-focused constructs (Brown & Grant 2010: 104). This critique suggests that authors coming from the information systems background fail to show how ICTs fit in with the development of disadvantaged communities. The failure is said to be fuelled by lack of integration of development and economic theories (Brown & Grant 2010: 105). Further criticism on the ICT4D is that they fail to test the assumptions they make on ICTs' contribution to socio-economic development (Avgerou 2009: 9). The study by Gxulwana, which was focusing on the impacts of ICT4D, failed to show how the mobile phone addressed the developmental goals of a community in Eastern Cape. The author managed to define what development means for the targeted community, but lacked an in-depth discussion of the perceived development goal as being appreciated or not by the researched community. Rather, an overview of the mobile phone usage was provided which could have been expanded to demonstrate the community's level of usage pertaining to any appreciation or challenges arising from the mobile phone (Gxulwana 2010: 88, 89). Krauss (2009: 18) has responded to this shortfall, and advises that those wanting to contribute to development should realise the importance of reacting to and "servicing" the perceived needs and requests of the community. In that manner ICT initiatives that are introduced will, therefore, be relevant to the community. The needs can be identified in a process that she terms "fact finding" or "needs analysis" as prescribed by Percy and Hawtin-Smith (2007: 3, 4).

1.2.4 General contributions of ICTs

Modern technology is increasingly making its mark in the social arena. ICT devices and software are being advocated as the means of relieving some social challenges and helping businesses to operate well. This has attracted a great deal of interest from authors from different disciplines who then write about ICTs. These authors focus either on ICT4D or ICTs in development whilst others focus on both approaches (Avgerou 2009). The different disciplines report on the ICTs' contributions in areas such as education, health, social and economic conditions. It is believed that the importance of these ICTs is to assist in improving the quality of education in some countries (Department of Education 2004: 8, UNCST 2002: 36). Multimedia material such as educational material can be delivered in the classroom through ICTs (Nokia Siemens Networks 2007: 4). Moreover, such content can be useful in informal learning as well. The use of texting has also been reported to be beneficial in improving literacy and numeracy (Aker et al 2010: 6). These ICT devices encourage learners to continue to learn outside the classroom. ICTs help in enhancing health provision and infrastructure in communities (Aker et al 2010: 9).

In health, the ICTs contribute in the communication and management of diseases. The use of short messaging service (SMS) is the most popular form of communication. For example, SMSs are sent to patients to remind them about taking their chronic medications (UN 2010a: 10).

Labelle (2005: 8, 17) also argues that enhanced access to information can improve the lives of people and stimulate the economy. Access to information enabled by ICTs can assist businesses to market and transact in different areas. Information on trading and pricing of goods especially for those in the isolated rural areas can be easily accessed (Ariyabandu & Zengpei 2009: 29). According to Labelle (2005: 17), ICTs are important because they assist in expanding and speeding up business transactions which are vital in reducing poverty. Poverty is still a major problem especially in developing countries. According to the United Nations (UN) (2009: 4), the poverty rate in developing countries increased from 16 per cent in 2006 to 17 per cent in 2008, despite the Millennium Development Goals of aiming to reduce poverty by the year

2015. They have recently reported that their success towards the MDGs is that only “half a billion fewer people” are living in poverty (Yudhoyono et al 2013: 1).

According to Achimugu et al (2009: 43), the interest in ICTs is well integrated in education, businesses and social activities. Furthermore, he argues that the integration of ICTs is evident by the availability of services such as the Internet at universities, Internet cafés and research centres. Labelle (2005: 28) argues that the global economy is information driven, and for businesses to be able to compete in this economy, they should be able to use appropriate ICTs. In addition, ICTs are described as tools that can be used to facilitate business processes (Labelle 2005: 27). According to Labelle (2005: 37), the efficiency of ICTs can be measured when there is more growth in the economy with respect to the gross domestic product (GDP) contributions from diverse industries of the country’s economy as well as greater participation in the global economy through trade and export of goods and services. Other authors have reported on how ICTs were used to market products, trade between rural areas and the cities, conduct e-commerce, and use multipurpose centre to create employment (Chigona et al 2009: 144, Esselaar et al 2010: 53, Pride Africa 2010: 619).

The aforementioned points are valuable, but there is a need to consider all the limitations that come with the usage of ICTs, particularly by rural communities. There are cost implications and infrastructural challenges involved in the usage of ICTs. Labelle (2005: 67) acknowledges that the cost of ICTs and lack of infrastructure affects the adoption and usage of ICTs, except for mobile phones. Even though ICTs such as mobile phones are seen as not having been affected, connectivity issues remains a challenge for some rural communities (Wafula-Kwake & Ocholla 2007: 247).

According to the Department of Education (2004: 8), ICTs have increased the effectiveness and reach of development interventions around the world. For example, in Uganda farmers were using the mobile phone to communicate with buyers, governments, nongovernmental agricultural extension agents and community members (Martin & Abbott 2011: 24). The farmers used the mobile phone to coordinate meetings and confirm prices before expending on fruitless travels. Moreover, ICTs have enhanced good governance and lowered the cost of delivering

basic social services (Department of Education 2004: 8, Kleine & Unwin 2009: 1047). The concept of e-government is important in linking the government with citizens. E-Government refers to the online presence of different government departments and enabling citizens to easily access various services through ICTs (Mpinganjira & Mbango 2013: 38, UNPACS 2016: 1). Moreover, it involves a process where ICTs are used to automate government's internal operations and external ones with the citizens (Narayan & Nerurkar 2006: 33). In some countries, citizens can pay their services online without visiting a specific department. For instance, in India, e-Seva was introduced to enable citizens to pay for their services. This is a one-stop service station where citizens can pay their utility bills, taxes, insurance certificates, permits, licences, and purchase tickets for public transport (Harindrath & Sein 2007: 6). The challenge, however, with such e-services is that they may encourage fraudulent activities if the operating systems are not well guarded. In the e-Seva case, it was found that the system accepted incorrect payments for electricity because there were irregularities with the payment module (Harindrath & Sein 2007: 6). Access is also a challenge for citizens who have to access these e-government services with their own ICT resources and those who are not accustomed to this online method (Jun et al 2014: 142, Mpinganjira & Mbango 2013: 44).

The production side of ICTs also plays a major role in decreasing the unemployment rate by absorbing more people in the labour force. The use of telecommunication services such as public pay phones to earn money is another way of relieving issues of unemployment. Comfort and Dada (2009: 6) relate the example of women in Nigeria and how their mobile phone kiosks assisted the community to receive money sent by relatives from the cities. Airtime is bought and the code is sent to be redeemed for cash at the mobile kiosks. In Mozambique, women embraced the mobile phone because it helped them to contact suppliers when they needed stock (Macueve et al 2009: 26). The village phone services were introduced in Rwanda through a loan scheme to enable community members to run businesses on telephone services (Futch & McIntosh 2009: 7). The entrepreneurs were provided with mobile phones that they could pay off over six months. Services offered included making calls and buying airtime cards.

ICTs have been used with the belief that they are an important cost-saving factor (Achimugu et al 2009: 38). The Ministry of Education and Sports in Uganda introduced ICTs in their curriculum, and it has been reported to be effective (UNCST 2002: 92). ICTs are, however, dependent on the availability of other infrastructures. According to UNCST (2002: 42), successful use of ICT in developing countries depends on many other factors, especially cost, availability of appropriate resources and expertise. The inequality of access to services is what makes the use of ICTs differ between rural and urban areas. Basic prerequisites like the supply of electric power should be increased to meet the needs and demands of some rural areas (Esselaar et al 2010: 8, InfoDev 2011: 11).

The problem with ICTs is that they are overemphasised to an extent where people fail to acknowledge when they are not benefiting the communities. The communities survive on the hope that an ICT intervention will change their lives for better even when they fail to. For instance, in a study by Futch and McIntosh (2009: 21), it was found that the mobile phone services which were supposed to help community members earn a living were actually not benefiting the involved entrepreneurs. Instead, their profits were used to pay off the hefty loan repayments for the mobile phone. The study of Eijkman et al (2009: 19) reported related issues where m-pesa (mobile transfer money business) agents faced challenges of collecting less profit due to a small number of transaction conducted in day. The agents were also located far from the bank branches that ended up costing them time and travel fees to rebalance their transfer liquidity. Security issues are also a large challenge for users. These ICTs often do not make use of local language and content which renders them inaccessible to some community members (Asaba et al 2006: 150). Affordability is one of the challenges in acquiring ICTs (Gikenye 2012: 53). The unemployed and the poor will therefore not be able to use expensive ICTs. Access to ICTs is discussed in detail in the next chapter.

1.2.5 ICT access issues in Africa

Inasmuch as some people are reaping the benefits of ICTs, this is not the case with the majority of people in developing countries. According to Achimugu (2009: 38), ICTs have not been effectively adopted by many micro-enterprises, agro industries, small traders, farming/livestock households, public offices, schools and health centres in

developing countries. Issues of access are determined by availability of infrastructure in communities and individual users' ability to afford such ICTs. Balboni (2010: 12) reports that key determinants of ICTs' diffusion is variables such as income, education, and whether a person lives in urban or rural area. Rural communities are, in most cases, left out from the information world due to lack of infrastructure as compared to their urban counterparts. Inadequate infrastructure therefore limits ICT diffusion and usage by such communities (UN 2005: 70). Lack of access to ICTs is limited in developing countries due to (Achimugu et al 2009: 46):

1. inadequate communication network infrastructures;
2. relatively high cost of equipment that could not be afforded by the large low-income portion of the population;
3. lack of government interest and support; and
4. problems associated with technical and management support for Internet connections.

The problem of access may not, however, be as big a challenge as perceived and could be solved. The challenge is that once the infrastructure is set up, there is a need to maintain it so that connectivity can be sustainable. Poor connectivity remains a hurdle for many developing countries as was noted in Nigeria and Mozambique (Comfort & Dada 2009: 48, Frere 2012: 2, Macueve et al 2009: 34). Achimugu (2009: 39) advises that when installing new infrastructures or upgrading old ones, the infrastructure should be financially sustainable and used maximally. Moreover, maintenance is another requirement as wireless telecommunication services are rapidly replacing wired ones in pursuit of fast and effective services. Such demands, especially the cost-reliant ones, could in a way affect an adoption of such technologies. Other challenges that affect ICT adoption relates to sustainability of wired and wireless networks; cost of connection; security issues; political instability or policy inconsistencies and lack of effective coordination (Achimugu et al 2009: 41, Frere 2012: 48, Kyobe 2011: 263).

The aforementioned challenges indicate the manner in which access is unequal. Achimugu et al (2009: 42) is of the opinion that a more precise way of measuring access is to examine the availability of ICTs in households. However, it should be

considered that availability in itself is not a guarantee that those available ICTs are being used for developmental purposes. The introduction of measuring indicators was as a result of trying to monitor ICT access. For example, a high level of ICT coverage with a low level of use suggests that other barriers besides infrastructure could be the cause of not accessing ICTs. In the case of Nigeria, for example, the people may not be using an ICT service for different reasons ranging from lack of interest, illiteracy, lack of awareness, exorbitant rate of services, poor quality of service and low or lack of finance (Achimugu et al 2009: 42, Chigona et al 2009: 7, Mpofu & Watkins-Mathys 2011: 191).

1.2.6 The role of mobile phones in development

Access to other ICTs is still a problem for some areas due to cost and infrastructural challenges (Milek et al 2011: 131, Chaputula 2012: 365). However, infrastructural requirements of devices such as mobile phones are not as costly compared to other ICT devices such as fixed telephone lines (FTLs). The use of FTLs in Africa was not only for private households and businesses but through public pay phones as well (Stork 2011: 76). According to Sahfeld (2007: 22), the high uptake of mobile phones in Africa was as a result of institutional bottlenecks with FTLs. This is evident in the high presence of mobile in African countries. The World Bank (2011: 1) reports that in Sub-Saharan Africa, there are 15 FTLs per 1000 population size. The mobile phone distribution for the same population group is 373. Users, due to the availability of mobile phones, no longer prefer the use of public pay phones. An average of 50 per cent of the people in Botswana, Ghana, Kenya and Namibia had lost preference in using the public pay phones and opted for mobile phones (Stork 2011: 79). The World Bank has ranked African countries by the number of people having mobile phones to depict the adoption of the device. The top five in the list are Seychelles, Botswana, South Africa, Gabon and Mauritius. South Africa is ranked number three with its mobile phone presence calculated at 942 per 1000 people. Seychelles, Botswana, Gabon, and Mauritius had the coverage of 1042, 961, 931 and 852 respectively (World Bank 2011: 1).

It is thus with this high level of proliferation that the mobile phone was chosen as the main device for the study's impact measurement. The developing world accounts for two-thirds of total mobile phone subscriptions, whereas Africa has the world's fastest

growing mobile phone market (Garside 2009: 1). In South Africa, the distribution of mobile phones was at 12,9 million in 2011 (STATSSA 2012c: 99). In Kenya, young people are encouraged to start small businesses in the mobile application industry as it is believed that the market will grow. Opportunities in this industry include application development, app marketing services and mobile content production. According to InfoDev (2011: 11), mobile phone subscribers in Kenya are three times more than Internet subscribers. Although rural communities have other challenges such as low literacy skills, the mobile phone remains a device accessible by all. Mobile phone users do not necessarily have to be literate to use the technology and intermediaries are often used by the non-literate to obtain information from the Internet or to send messages (Jensen & Mahan 2008: 50).

The adoption of mobile phones in rural communities is based on basic functions such as communication and advancements towards usage in businesses. It saves community members travelling costs for both personal and business purposes. For example, relatives use the mobile phone to communicate instead of a visit (Comfort & Dada 2009: 50). Various studies report on how the mobile phones improve the businesses of small traders and help them save on transactional costs (Esselaar et al 2010: 56, Munyua 2009: 124, Sane & Traore 2009: 113, Tenhunen 2008: 6, Yitamben & Tchinda 2009: 133). Some people are using the device to address issues of crime. In South Africa, a farmer reported that he has tagged his livestock, when the thieves steal them the mobile phone reports to him (Molony 2008: 1). The mobile phone assists in tracking the direction in which the livestock is heading to assist in recovering them. Similarly, cashew farmers in Ghana use smartphones to improve the quality of their products. This is achieved by collecting the data through smartphones to identify quality related problems so that training can be provided to resolve such problems (Jeske & Hommers 2011: 2). The device is also used to monitor production so that the delivery trucks are informed on time about cashews that are ready for the market (Jeske & Hommers 2011: 1). The broader usage of mobile phones has also led to banks using these devices for people to transact on their mobile phones. Boateng (2011: 50) describes the role of mobile phones as transformative as they enable communities to use mobile banking, mobile advertising and other location based services. Such services were traditionally not possible as people had to travel to cities

to access them. The preceding discussions show the role played by mobile phones in communities and businesses.

1.2.7 SMMEs in improving socio-economic constraints

Small businesses are an integral part of most communities. They normally provide services that are in line with the needs of their communities. In South Africa, such businesses are called Small Medium and Micro Enterprises (SMMEs). SMMEs are regarded as instrumental in assisting communities to deal with challenges of unemployment by creating new job opportunities (de Kok et al 2013: 5). There are different definitions of SMMEs throughout the world and even within countries, the definitions differ depending on the industry in which they operate (Esselaar et al 2007: 88, STATSSA 2005: 4). In South Africa, SMMEs are defined as enterprises that are characterised by a certain number of full time employees (FTEs) and fall within a certain turnover bracket depending on whether it is a small, medium or a micro enterprise (South Africa 1996b: 14). Business assets of less than R30 million also qualify businesses to be classified as SMMEs. The number of employees is between one and 200 with a turnover of less than R50 million. Small enterprises employ less than 50 people, micro enterprises five and medium enterprises a maximum of 200 (South Africa 1996b: 13). However, the services industry such as transport, retail and wholesale trade are distinguished by a maximum employment rate of 100 employees. Within the SMME sector there are informal SMMEs which are not registered and they tend to be popular in most communities (Jeppeson 2005: 465). They are also regarded as micro enterprises. Informal SMMEs normally do business for purposes of surviving and are also called survivalist businesses.

For the purposes of this study SMMEs, will refer to a small business in the community that employs a maximum of 5 employees. These will include survivalist businesses; such business activities are a source of income. Unemployment issues are due to insufficient or unavailability of jobs to cater everyone in the job market. The unavailability of jobs is often due to the fact that there are more people in the market than there are jobs to absorb them all. The issue of skills is another factor that leads to non-employability of those without relevant and required skills. The SMME sector, with its range of services, allows those who cannot be absorbed into the labour market to become employed. Across countries, this sector participates in reducing

unemployment through self-employment, which offers employment for others as well (IFC 2008: 5, Jain 2008: 6, Modiba 2010: 30, von Broembsen 2008: 19). Often people who fail to secure employment also start a business as a means to earn a living (FNB 2009: 23). In South Africa, the SMME sector is also supported by the Government, which is pushing for municipalities to support this sector (Republic of South Africa (RSA)(South Africa 2010: 39). Other international organisations have shown support for this sector. The United Nations Capital Development Fund (UNCDF) has, for instance, initiated a local funding project in Tanzania to support SMMEs (UNCDF 2013: 5). This sector plays a major role in the economy despite the challenges that the sector encounters in the process. According to de Kok et al (2013: 22), the SMME sector does not guarantee good jobs for everyone in the job market. SMMEs often fail due to operational challenges encountered during the course of their businesses. The challenges are mostly caused by lack of resources such as finances, information to markets and management of their business (UNCTAD 2011: 69, UNCTAD 2013: 67). The management of the business is at times related to lack of skills required to sustain a business. In a study conducted in South Africa's Toyota plant, the involved SMMEs indicated a need for skills and technology development amongst others (UNCTAD 2010: 10). Some enterprises are not formalised which makes opportunities for funding and other required support not feasible (UNCTAD 2013: 66). Although the informal sector in South Africa contributed to employment, this sector's growth has been declining. Statistics SA indicates that the informal sector has been performing poor since the 2011 whereby 128 000 jobs were lost in the second quarter of 2012 (STATSSA 2012f: x). Such performance reflects the failure of not only the informal SMMEs but of the sector as a whole. Additional support is therefore required to help SMMEs become sustainable.

ICTs are believed to have the capability to strengthen this sector and help it flourish. According to Hassanin (2009: 57), this can be achieved by the ICTs' ability to expose SMMEs to international markets, and by removing trade barriers which are accessed by monopolies. However, Chen (2005: 47) argues that earnings of SMMEs depends on the size of the enterprise, which means that the smaller the enterprise the lower the chances of that enterprise hiring more personnel. This then affects their likelihood to invest in ICTs. Multipurpose Community Centres (MPCCs) serve as an easy mode for communities, including SMMEs, to access ICTs in developing countries. For

example, in Kenya, MPCCs were used by farmers for bidding, receiving offers and pricing for their commodities (Asaba et al 2006: 145). However, in this case, access can be affected by the distance factor where people could not easily reach those ICTs (Alampay 2006: 7). These MPCCs were in some areas found to be failing dismally as they had to serve more people. In Gauteng for example, thirteen (13) MPCCs were supposed to serve over 2,5 million people within a radius of five kilometres (Esselaar & Gillwald 2007: 25). Thus, the issue of access cannot be entirely be resolved by MPCCs.

1.2.8 The impact of gender

Women suffer from poverty more than their male counterparts. Naturally, women are the ones who play a caring role in families. In both the developed and developing countries, the burden of household work affects their participation in paid jobs when compared to men (ILO 2012: 35). In fact, most households headed by women in South Africa are larger, whereby the females have 3.7 dependents compared to 3.3 for males per household (STATSSA 2010: 5). With the responsibilities that women carry, they are the ones who lead the statistics of unemployment. In 2009 it was estimated that unemployment will reach 6.1 to 7.0 for men as compared to 6.5 to 7.4 per cent for women globally (UN 2009b: 4). The International Labour Organisation (2012: 4) recently found that the global gender employment was at 6.4 for women and 5.7 for men. This shows an increase in women's unemployment rate. This, therefore, means that families which are depending mainly on women as providers are vulnerable to poverty. This also exacerbates the child mortality rates and malnutrition for infants, which in turn affects a country's population. According to the United Nations (2010b: 7), under-nutrition is one of the factors that causes child mortality. In South Africa, when a head count of people living in poverty was done, results showed that 65.5 per cent of children lived in poverty compared to 45.2 of the adult population (Chitiga et al 2010: 9). According to UN Women (2014:32). The gender division of labour between the paid and unpaid work creates inequalities. Moreover such discrepancies on unpaid work for women and girls has implications on their choices to pursue education, paid work, a decent standard of living and participation in politics. Such inequalities mean that women's participation in development programmes may be limited. Interaction with ICTs will to a certain extent be affected a well due to financial and time issues which will inhibit women from accessing the devices.

Issues of poverty can, however, be resolved if there is adequate employment. SMMEs are seen as one of the solutions to decrease poverty in countries where the unemployment rate is high. Education is another tool that can assist in relieving poverty in most households. However, the scarcity of jobs deems it impossible for education alone to relieve poverty. As a result, the SMME sector provides self-employment to people who cannot be absorbed into the labour market. Jain (2008: 6) affirms that self-employment is sometimes the only source of income for the poor, and that SMMEs are in most cases the main employers in poor regions and rural areas. Radebe (2009: 2) and von Broembsen (2008: 19) further state that SMMEs create employment for the semi-skilled and unskilled people, and they can contribute significantly to poverty alleviation. The SMME sector proves to have the ability to bring change to people with no hope of employment but extensive support is required to assist SMMEs to grow and become sustainable.

1.2.9 The educational landscape

According to Unterhalter (2003: 208), education has the ability to develop certain qualities in people, and this can later be used to contribute towards economic productivity. Education can be formal where people attend school and learn. Formal learning also includes the adult basic education where older people in a community can be introduced to learning. People can also learn informally by acquiring certain skills without training. According to Colardyn and Bjonavold (2010: 70, 71), formal learning is structural and has certification, whilst informal learning is intentional and without certification. When a person is educated, then that particular person becomes exposed to opportunities of employment and/or also becoming innovative in starting his/her own enterprise in order to partake in socio-economic activities. For instance, Delmar (2011:11) argues that in areas where mining activities are taking place within communities, those mines do not employ local people because they lack basic literacy and numeracy skills. Lack of education is, therefore, limiting these people from being employed. Sen (2005b: 35) states that education is important in that it increases one's ability to produce commodities, which adds value to economic production. Furthermore, an income that an individual earns from this activity grants him/her an opportunity to lead a life he/she desires.

Education is not easily accessible in most African countries. People are faced with the challenge of poor education due to poor or non-existent infrastructure. The challenges of infrastructure is related to the lack of classrooms, sanitation facilities, water, electricity and computers (DBSA 2008: 37, Orkin 2011: 8). Holloway's research on the infrastructural challenges in Malawi depicts learners who attend school under trees (Figure 1). Unavailability of learning materials such as textbooks is a huge challenge for some schools (DBSA 2008: 31; 36, Hollow 2010: 127, Milek et al 2011: 3, 11, 25). Whilst some countries are looking forward to having smart mobile devices to be taken home for study purposes (McKinsey and Company 2012: 12), some learners do not have basic textbooks to use in schools and therefore cannot take them home. Issues of the HIV/AIDS pandemic have also contributed to the challenges, with some learners having to take care of their orphaned siblings. This, in South Africa, has led to more child-headed households where children have to attend to the adult roles of caring for their siblings whilst sacrificing their opportunity to learn (Mogotlane et al 2010: 24; 29). It is also reported that some educators are not well qualified (UNESCO 2011: 47), which leads to learners not receiving quality education. Administrative issues that fail to be resolved in most cases leads to absenteeism of teachers. For example, in South Africa, when educators are not happy with the education administrative system, they conduct demonstrational "strikes" in order to voice their concerns (Mail & Guardian 2010: 1, Tshangela 2010: 1). This, in turn, affects the learners because during the educators' absence, learners do not have anyone to teach them. According to Spaul (2012: 7), the poor quality of education begins as early as pre-school for some poor people. Children at this stage fail to receive mind-stimulating content required for their mental development. Moreover, these pre-school facilities are often used simply as child-minding facilities.



Figure 1.1: Learning under the tree

Source: (Hollow 2010: 287)

In response to some of the challenges facing the education system, the e-Education policy was developed by the Department of Education in South Africa (Department of Education 2004: 17). The e-Education policy was prepared with confidence that the use of ICTs could assist in solving some of the social challenges related to learning. The rollout of computers to some schools was part of the strategy of enabling these schools to be part of the information society (Department of Education 2004: 12). The policy, however, has not been able to clarify on how the abovementioned challenges can be solved by ICTs. Nevertheless, as most countries are moving towards incorporating ICTs in schools (U.S. Department of Education 2010: 67), this might assist in reducing some of the social challenges. The improvement and building of infrastructures to support ICT usage can result in job creation, which might address unemployment issues. For example, Manyika and Roxburgh (2011: 1) report that the Internet accounts for 3.4 per cent of large economies, which makes up to 70 per cent of the global GDP. This means that the higher the usage of the Internet, the higher the economic prosperity. Investment in ICTs also means the production side of ICTs will grow and in turn benefit the people and the economy. As the advantages of ICTs are observed, their disadvantages should be looked at and mitigation factors prepared.

1.2.10 Measurement of ICTs

According to Garside (2009: 3), in order to measure the success of ICT projects in communities, a set of monitoring and evaluating tools and frameworks must be developed and be replicated in local contexts. Indicators have been instrumental as measurement yard sticks. Indicators can be defined as instruments that enable an assessment of a certain variable studied (Babbie 2011: 107, Yudhoyono et al 2013: 57). Indicators often reflect objectives that need to be achieved with reference to expected outcomes (Ukaga & Maser 2004: 13). Achimugu et al (2009: 43) states that the conventional way of measuring access is to divide the number of access devices or services by the total population, although he believes that this might be misleading. Moreover, they argue that a per capita indicator does not reflect the socio-demographic composition of the nation. This means there should be other ways of measuring access to ICTs without compromising the results.

According to the UN (2005: 25), the household unit helps in eliciting information about the facilities available in the household (for example, whether there is a TV, computer or Internet connection). The individual unit provides information on the use of these facilities, (both at and away from home) and the intensity of usage. The emphasis on household indicators as well as that of an individual was also noted in ITUs (2014b: 4, 35) work. The similar approach is followed by Achumugu (2009: 43); below is a list of how the household and individual indicators are calculated. The second set is on business usage.

Indicators on Access to and use of ICT by Household and Individuals

- a. Proportion of households with satellites/cable television connections;
- b. Proportion of households with a fixed line telephone;
- c. Proportion of households with mobile phone;
- d. Proportion of households with a computer; and
- e. Proportion of households with Internet usage at home.

Indicators of ICT Usage by Businesses

- a. Proportion of businesses using computers;
- b. Proportion of employees using computers;
- c. Proportion of businesses using the Internet;

- d. Proportion of employees using the Internet; and
- e. Proportion of businesses using the mobile phones.

1.2.10.1 Indicators in measurement

Globally, there are indicators used to measure ICTs. Indicators in this case refers to the level of access to ICTs by the population, they are expressed through a percentage of the population having access (Achimugu et al 2009: 42). These indicators were developed at the World Summit on the Information Society (WSIS), by different head of states, with the objective to measure the progress towards an information society and to benchmark access on an international level (UN 2005: 1). They are relevant in determining access to information by all countries. The efforts are sound as they encourage other countries to form part of the information society. However, the comparison cannot be on the same level, as developing countries would be compared to developed countries. The developing and developed countries are already in different levels as far as ICT access is concerned.

Indicators are used in order to assess if programmes are making any difference where they are deployed. According to Okuda (2009: 9), ICT impact is more easily measured economically than socially. Dymond and Oestmann (2004: 43) advises that in measuring impact it is best to maintain balance by focusing on the economic side first and then focus on the social side. They state that this can be achieved by focusing on users' needs and demand as well as the development rationale and impact.

ICT indicators have important roles to play in formulation, implementation and evaluation of ICT policies and strategies (Okuda et al 2009: 16). Moreover, they can assist in the need assessment, monitoring progress as well as providing feedback and evaluation. Global indicators on access and usage of ICTs were part of the United Nations strategy to measure different countries' access and usage. There are forty-one indicators and the main themes are: access to infrastructure; access and use by household and businesses; ICT production sector; and ICT goods trading (United Nations 2005: 1). On the access to infrastructure indicators, several may not be measured in rural communities of South Africa. For example, indicators such as the Internet and broadband subscription are not popular in some rural communities. This means that with all the indicators that do not directly apply to such communities,

international standards will still be applicable. As a result, countries will not reach the targets with such rural communities. Research already states that developing countries rate very low on global indicators when compared to other countries (Jensen & Mahan 2008: 47, Okuda et al 2009: 17). This could be as a result of various challenges that developing countries have with regards to accessing ICTs. The other possibility could be that the existing indicators hold a higher standard, against which some countries should not compete. For example, in support of Jensen and Mahan (2008: 48), issues like shared use, community networks and telecentres are strategies that are not yet fully reflected or measured by global indicators agreed to by the United Nations “Partnership in Measuring ICT for Development”. In addition, gender disaggregation is also not addressed in the core indicators. In particular, females were found to be less likely to use the Internet even once access is provided (Balboni 2010: 15). Moreover, when access has been granted, this does not necessarily mean that the gender digital divide will end. Digital divide is defined as a concept used to explain unequal access to information and communication technology on a local and global level (Sikhakhane & Lubbe 2005: 4, Wyatt et al 2005: 200).

It is therefore necessary that these indicators are refined to suit local contexts. Indicators of ICT use are needed to correctly analyse the impact of ICTs, including the spill-over effects into non-ICT economic sectors and how ICTs help accelerate the diffusion of knowledge (UN 2009a: 8).

1.2.10.2 Existing measurement tools

In addition to the global indicators, there are various frameworks and models discussed in Heeks and Molla’s work. These frameworks can be generic, sector, method, issue, discipline or application specific (Heeks & Molla 2009: 6). A shortcoming with these frameworks is that they have been applied in developed countries. The livelihood framework is an example of one of the tools that researchers have used in attempting to measure the impact of ICTs. According to Parkinson and Ramirez (2006: 9), the sustainable livelihood (SL) framework was designed to be applied in a rural context. They further argue that it lacks the mechanical aspects of doing measurements in urbanised areas. In their analysis, it seems as if the framework did not do justice in measuring the impact of telecentres. This could be the mechanisation that is said to be missing. Hence, the authors used it selectively to

address aspects that the framework could answer (Parkinson & Ramirez 2006: 10). The holistic approach of this framework does make sense, but it needs to be complemented by other methods that will be able to capture the use of ICTs accurately. Parkinson and Ramirez (2006: 10) also acknowledge that the SL framework is not the “be-all-and-end-all” for ICT4D impact assessments, but it is a useful and powerful analytical tool that deserves greater attention.

Tripathi (2012: 825) has followed the SL approach for ICT in development of rural communities. He used the SL assets to show how each can be transformed by the use of ICTs. Whilst Parkinson and Ramirez could not tie some assets to the technological reference, they extrapolate on how this can be achieved. For example, the natural asset is enhanced by showing how communication can be used between government ministries, land owners and local government officials to effectively manage land and other natural resources (Tripathi et al 2012: 825).

What can be drawn from these SL experiences is that a framework should be relevant, and it should address all concerns important for the development a community. The identified key concerns will then have to inform indicators for measurement of such.

Amongst the existing measurement tools, frameworks used by Krauss and Boateng gives an example of how measurement tools can be designed to suit the context of the communities studied. An “ICT competency guideline for knowledge literacy for teachers” was adapted from the UNESCO’s framework (Krauss 209: 32). “A conceptual framework of the impact of mobile phones on micro-trading” was also developed for the users of small businesses using the mobile phone (Boateng 2009: 58). This provides a good foundation for this study in the development of the matrix, to measure the effectiveness of mobile phones in rural communities.

1.2.11 Abuse of mobile phones

The popularity of mobile phones raises issues of security and privacy. Security and privacy becomes more important when children also use these devices. The diffusion of mobile phones amongst children and teenagers is growing. The relevance of this device is argued to enable contact between parents and their children (Weerakkody 2008: 459). They further maintain that the mobile phone itself is not dangerous, but

the manner in which individuals can make it bad. In a study conducted by Lenhart (2010: 3), it was found that teenagers aged between 12 and 17 years had sent and received sexually suggestive nude or nearly nude pictures to and from others using mobile phone text messages. Moreover, the content was not only shared with people whom they were romantically involved with, but with those they hoped that they would have a relationship with in future. According to Brown et al (2010: 13), 30 per cent and 50 to 70 per cent of teens in Holland and the United States (US) respectively had accessed sexually explicit images online. In South Africa, the mobile phone is, to date, being used in distribution of content that is quite sensitive amongst children and other community members. The children themselves, particularly learners, have been involved in the recording and distribution of abusive and pornographic content. An example is the gruesome abuse of a mentally handicapped girl. Her rape was recorded and the video was distributed throughout South Africa (Global Post 2012: 1). The content was videotaped using the victim's mobile phone and was later posted on the Internet. Similar pornographic content was distributed via Bluetooth feature [a wireless technology to exchange mobile phone content] in 2009 by teenagers in South Africa's North Mead Secondary School, and later uploaded on the Internet (Nair 2009: 1).

On a community level, the spreading of sexual content affected the families of the involved parties. The sister of a police reserve woman who was videotaped having sex with a correctional officer complained that such material was not supposed to be distributed publicly (Aaltion & Heilmann 2010: 1). The concern was that the material would affect the woman's children. This demonstrates the insensitiveness of people who use mobile technology to spread such content.

Cyber bullying is another issue that affects children using mobile technology. According to Yang Su (2011: 1), some online content exposed children to cyber bullying. The hazards can be controlled if teachers are the ones controlling access to educational content sites. However, Msiska (2007: 248) argues that developing countries do not have the capacity to deal with cyber related crimes. The vast growth of mobile technology requires users and communities to exercise caution when dealing with it. Pedro (2012: 316) maintains that issues of security where ICTs are involved should be put in place to prevent breach of privacy and alteration of data

which could lead to ICT fraud. The use of mobile phone needs to be monitored in communities, especially with regards to content accessed and distributed.

1.3 RESEARCH PROBLEM

There is a proliferation of mobile phones in South African communities, including rural ones. This has resulted in the mobile phone being used as the main mode of communication. The mobile phone is an important device used by individuals and communities for different purposes. It is therefore important to understand the level of usage and how rural communities experiment with other applications of the mobile phone. The extended use of its applications is said to be reaching the rural parts of South Africa as well. However, there are limited measurement tools for ICTs in general for rural areas. The available global indicators as provided by the Partnership for Measuring ICT in Development aim to benchmark access on an international level (UN 2005: 1). The efforts are sound, as they will encourage other countries to form part of the information society. However, the comparison cannot be on the same level, as those in developing countries will be compared to developed countries. The developing and developed countries are already in different levels as far as ICT access is concerned. Most developing countries are still facing basic challenges of accessing ICT infrastructures. Jensen and Mahan (2008: 47) also noted that developing countries were having low ratings with regards to the global indicators as not all countries could report on all forty-one indicators. The global indicators are therefore exercising an irrelevant and unfair comparison for developed and developing countries.

However, the existing indicators can be used as a guide for the developing countries. Countries should be able to adopt the indicators that are relevant to their situational needs. These indicators should also be amendable to suit each country's measurement of access. For instance, in Thailand, they use individuals' access instead of households in some indicators (Okuda et al 2009: 13).

The measurement tools are important in making sure that the ICTs are really contributing towards individual and community development. They can also serve in indicating and rating users' skills that they have gathered through the use of various

ICT applications. The information can be used for employment purposes for job seekers. Since the mobile phone is the most accessed ICT device, there is a need to know how rural community's usage can be measured so that their usage can be maximised. Fraudulent activities can also be identified and eliminated. Failure to ensure safety measures on using this device may result in the mobile phone not being used effectively. However, measurement tools for mobile phones are scarce. The framework designed by Boateng (2011: 58) focused on the use of mobile phones in Africa. The framework provides a good foundation due to its focus on the ICT that is used mainly in Africa. The only shortfall, however, is that it was developed only to measure impact of the business sector. It is therefore imperative to design frameworks/models and matrices that will be suitable for the wider South African context. This study developed a matrix that can be used to measure the impact of mobile phones in rural communities of South Africa.

1.3.1 Research questions

In order to address the problem explained in the previous section, the following main research question was posed:

How to develop a matrix for measuring the impact of mobile phones on development in rural communities?

In order to answer the main research question, the following research questions were posed:

1. What are the evaluation criteria for measuring the impact of mobile phones in rural communities?
2. What are the effective measurement criteria for the impact of mobile phones in rural communities?
3. What are the monitoring tools for impact assessment of rural development?
4. How are mobile phones improving the lives of the people in rural areas?
5. How can a matrix assist in making the mobile phones efficient in rural community development?
6. How to develop a matrix to measure the impact of mobile phones for rural communities?

1.4 AIMS AND OBJECTIVES

The aim of this study was to understand the impact of the mobile phones in rural communities with regards to development and how it can be measured. This was undertaken by unpacking the following primary objective, which is to design a matrix that will assist in measuring and monitoring the impact of mobile phone technology in the rural community.

In order to achieve the above-mentioned objective, the following secondary objectives were set to:

- Investigate how the community members use mobile phones;
- Determine how the identified usage by different groups in the community can be measured;
- Identify the indicators for measuring impact assessment;
- Adapt indicators that will be necessary for the sectors within the identified rural community in South Africa;
- Determine how the identified indicators can be evaluated and measured; and
- Produce guidelines that will assist in creating a matrix for measurement and monitoring.

1.5 SCOPE OF THE THESIS

The researcher conducted the research in Mpumalanga Province, at an area called Phake Rebone. The community of Phake Rebone, which is rural, was targeted where representative members of the community formed part of the study. The study focused only on the use of mobile phones and its applications as a means of conducting businesses, communicating, learning in school and other activities important in that community. Other ICTs such as computers, faxes, and printers and so forth were not addressed.

1.6 CHAPTER OUTLINE

The study was structured to have eight (8) chapters. The brief overview of the chapters is provided below.

Chapter One: Introduction and background

The first chapter focused on the introduction of the study. It looked at the theory base, conducting a general literature review related to the use of ICTs for business, education and personal matters. The measurements of some ICTs were explored, with attention paid to indicators as measurement tools. The misuse of mobile phones was discussed to understand the impact that it has on users. The proposed conceptual matrix was discussed exploring on how it could be applied using education as an example. The chapter also defined the research problem and the research questions were developed to guide the research process. Aims and objectives were set in order to enable the researcher to address the posed questions and conduct the study in the identified sample area.

Chapter Two: Literature review and theoretical framework of mobile phones

This chapter looked at the related literature, which focuses on ICTs and their various uses. The concept of development was discussed exploring how it unfolds and links with ICTs. The importance of mobile phones in rural and urban areas was addressed as well as the impact of gender in ICT usage. Measurement of ICTs was also briefly discussed.

Chapter Three: Theoretical framework

The theoretical framework of mobile phones was discussed as well as the existing tools for impact assessment. The impact measurements in rural communities, education, business, health and government bodies were also addressed. The researcher further looked into how the global indicators have been measured in the African context, particularly in South Africa. Various measurement instruments for impact assessment were argued with reference to their relevance in developing rural communities. An analysis of the key impact assessment tools was also provided.

Chapter Four: Historical and case study overview

This chapter painted the history of South Africa illustrating how the researched community fits in its context. South Africa's developmental history and the legacy of the infrastructural imbalances were shared. The chapter further provided an overview and the description of the researched area. Attention was paid on the community and its population's activities. A needs analysis of the community was also developed.

Chapter Five: Research design and methodology

This chapter discussed the research design of the study and presented the methodologies that were used in conducting the research.

Chapter Six: Case study presentation and analysis

The findings of the fieldwork were presented, followed by the analysis. The data was presented with focus on the core groups of the community and how they used the mobile phones. The analysis focused on how each group used the mobile phone's applications for various functions.

Chapter Seven: Discussion of results and proposed matrix

This chapter focused on the discussion of findings and how they influenced measurement and evaluation of a matrix that was developed for this study. The results were used to produce guidelines that could be used in developing a matrix. The proposed matrix was finalised based on the results of the study.

Chapter Eight: Conclusions

This chapter provided an overview of the study, summaries and recommendations. The study's research questions and objectives were revisited to provide a summary and determine whether the study succeeded in addressing the research problem. Moreover, conclusions were drawn based on the implications of the study's findings. The chapter was concluded with the research's contributions and recommendations for the practical use of the matrix.

1.7 CONCLUSION

This chapter provided an introduction and some theoretical background to the study. The role of ICTs in development was discussed as to how they contribute to sectors such as business, education and communities at large. It emerged that ICTs are penetrating the developing countries where the mobile phone is the device that is mainly used. The minimal infrastructure requirement of this device is the one that makes it popular even in rural communities. The use of indicators for measurement of ICTs was discussed to determine its current impact in developing countries. It was discovered that measurement tools to measure the impact of ICTs, particularly mobile phones, in developing countries do not exist. The background to the research problem was discussed and a research problem defined. The identified research problem was used to drive the study. The research questions of the study were developed as well as setting the study's aims and objectives. The scope of the research was set, followed by the chapters' overview, then the conclusions. The next chapter focuses on the literature review.

CHAPTER TWO

2. LITERATURE REVIEW

2.1 INTRODUCTION

Information and communication technologies (ICTs) have become a part of people's lives. The impact that they have on different aspects of people's lives continues to grow on both positive and negative paradigms. Their growth is also noticed by the ubiquitous presence of mobile phones that have managed to reach communities that previously could not access telephonic presence. This chapter presents a review of literature related to the use of ICTs. Attention is given on how the usage of a mobile phone and its related ICT services are being used for development purposes.

Parity in terms of living standards and the economy seems to be a difficult goal to realise, particularly between the developed and the developing countries. A number of people living in poverty in developed countries cannot be equated to the ones in the developing countries. Heinberg (2010: 154) distinguishes this by stating how, in the developed world, most people are obese due to excessive access to different types of food from across the globe. He further states that the Americans are more concerned about obesity, which signifies abundance and abuse of food, than hunger, where no food exists. Some of the developing countries are not exposed to such abundance but to poverty (Smith 2009: 115, UN 2009b: 4, Yudhoyono et al 2013: 2). This proves that challenges encountered by the developing countries are still more pronounced when compared to their counterparts. When looking at the issue of development, it has more impact in developed countries than in developing ones. This is due to the fact that some development initiatives are only recently reaching the developing countries recently as a way to allow them to leapfrog to the status of their counterparts (Yudhoyono et al 2013: 8).

The next section will focus on development. The discussion will be on what development entails, and its status in developing countries. Then a general usage of ICTs and mobile phones will be discussed in an attempt to understand their impacts on development. Issues of sustainability and barriers on the usage of ICTs will form

part of the discussion. This will be followed by a discussion of measurement tools for ICT impact assessment. The focus will be on the available measurement tools, tools used in rural communities and will explore whether the global indicators of the United Nations are replicable in South Africa. This will be followed by the conclusion.

2.2 DEVELOPMENT CONCEPT

The concept of development in developing countries is not as matured as it is in the developed countries. Development carries with it connotations that a particular change can bring improvements in certain or different areas of people's lives. In the case of developing countries such as South Africa, development brings with it, for example, opportunities to address unemployment through economic activities, improve road and telecommunications infrastructure. A sad reality, however, is that even the developed countries, for instance those in the United Nations, believed that developing countries, particularly African countries, can leapfrog to catch up with all the missed benefits of development. The United Nations Development Programme (UNDP) (2003:1) states that new technologies have spun a web of global connections, giving countries a chance to leapfrog decades of incremental technological advances. Unfortunately, infrastructural challenges (Macueve et al 2009: 28, Muller 2009: 33, Nokia Siemens Networks 2007: 3), among others, made technological advances impossible for some communities. The advent of technology, especially ICTs, was believed to assist African countries to successfully achieve leap-frogging. This suggests that developments in technologies lead to the development of a society.

Smith (2009: 122), in his quest to discover whether these tools (ICTs) can play a role in development, posited that the answer was twofold. On the one hand, it was clear that the inequalities of access to such technologies were the main downfall in allowing ICTs to enable development in some communities. Smith maintains that people's abilities to adapt and exploit appropriate technologies shape their ability to derive the benefit. On the other hand, whilst these technologies can transform people's lives, they also carry the power to exacerbate existing structural imbalances within communities and countries. This outlook challenges a view that for development to be fully achieved in African countries, ICTs can play a major role to fast track it. However, this does not mean that some communities may or may not realise the prophesied

benefits due to structural challenges. In a country like South Africa, for example, there are differences between suburban and urban areas. Another distinct difference is between the aforementioned areas and the rural ones. Infrastructural challenges of the latter are as basic as lack of electrification in some areas. The Integrated Sustainable Rural Development Strategy expounds on this:

“The cost of living for poor rural people is, therefore, generally higher than it needs to be because of their lack of access to transport and communications infrastructure, basic amenities such as water and electricity, and social services such as health and education”. (RSA 2000: 7).

Thus, this would make it difficult for inhabitants of such areas to reap some ICT benefits.

The importance of ICTs in development is of particular interest in assisting the researcher to answer the research problem of this study. Therefore, an understanding on how ICTs are impacting development and how they can be measured to truly prove their contribution in other communities needs to be reached.

2.3 HISTORY OF DEVELOPMENT

The concept of development is not easy to grasp as it contains differing meanings. This is due to the fact that development in itself is characterised by the contexts in which it is defined. As a result, it is considered by authors to be quite multifaceted (Ngwenyama et al 2006: 2). Development can mean different things to different people in any given era. It has definitions that change according to contexts in which it is applied. Development took place differently in different parts of the world. In the United States, for example, development is categorised as starting off in the 1600 up to 1920, this was called the expansion period with more land being farmed to produce sufficient food. The expansion period was followed by the mechanisation period that took place between 1920 and 1970. Mechanisation replaced many labour intensive forms of doing certain jobs. The use of machinery in farming and abundant fossil fuel energy resulted in increased productivity (Heinberg 2010: 160). At the same time, hybrid plant

varieties enabled higher yields, technologies for food storage improved and local surpluses can be transported globally (Heinberg 2010: 160).

In South Africa, development unfolded in different stages. The initial stage was when the Dutch established a refreshment centre in the Cape of Good Hope. An economic hub was set up where there was nothing of an economic nature before. The second rigorous one was in 1848 after valuable minerals were discovered. Industrialisation took place where roads infrastructure and ports were built for the transportation of mined goods and labourers who were working in the mines. The fights for gold mines led to the Anglo Boer war in 1899 in which the second war was won by the British and therefore continued with the development of the strategic cities. The country was modernised to suit the conquerors' state of living, which meant that there were roads, markets where goods are sold, schools, churches and other necessities. Technological developments also took place especially in telecommunications. For example, when the British were attacking the Boers in the Transvaal, they attempted to cut communication lines so that no one could inform the State in Pretoria of the intruders. In terms of human development, the system of apartheid, in which races were deliberately separated and treated unequally, meant that a small minority benefited from economic and technological advances. The majority, the black population, lived with limited resources and restrictions as to education, access to land, and free movement in the country. Apartheid had a profound effect on the country, discussed later in this dissertation.

Paramount in the development discourse is globalisation. Globalisation provides opportunities to conduct businesses anywhere, connecting clients in any part of the world (Huff 2012: 1433). Colonisation exposed South Africa to globalisation whereby the country was now trading with foreign countries. The ability to trade internationally helped to grow the then economy that resulted in investment on development. The labour demands and earnings were increased due to globalisation (Fedderke & Simkins 2012: 198). The labour demands are supposed to have an effect in the community through employment. The effects were noticeable in the manufacturing sector particularly for the unskilled labours (Fedderke et al 2012: 810).

Economists such as the Gaian economics (Dawson et al 2010), when examining development from an economic perspective, articulate the challenges that are borne by the industrialisation era and mechanisation processes brought by evolution. The authors are calling for societies to relook their way of doing things, particularly in the agricultural sector and the food we are currently consuming as a result of globalisation (Heinberg 2010: 162, Norberg-Hodge 2010: 175, Shuman 2010: 170). It is argued that through mechanisation, most farmers have been pushed out of the business, as food that could be produced locally can easily be imported and sold at a cheaper price in supermarkets (Norberg-Hodge 2010: 175). The problem is, however, not with all the technologies that are used in agriculture. The hybrid method of doing things is what is being challenged. This indicates that some technologies will be well received, and others will be shunned. This could have resulted from negative impacts arising from the usage of such technologies. According to Norberg-Hodge (2010: 176), the rural economy lacks support to rely on hybrid varieties that are often technologically dependent, although the mechanised production is supposedly cheaper. Technology has different aspects to it of which some have impact on development. The adoption to technology depends on its appropriateness and acceptability by the intended users.

The concept of development has been widely discussed and debated. Researchers, such as Gxulwana (2010: 13), (Monakhisi 2008: 66, 72), explored development theories in detail such as modernisation, dependency, alternative development, westernisation and classical Marxist. In essence, what all these theories emphasise seems to be change to a better state. A similar stance was identified in Chapter One; section 1.1, where participatory development was discussed. The key point of development is to improve the living conditions of people. However, it should be noted that development is different for everyone, depending on a community or individual's aspirations, even at the community level, development meant different things for different people (Gxulwana 2010: 93). Gxulwana's definition of development was leaning towards two theories, namely, the basic needs and capability approach. The former stresses the ability to meet basic needs of people such as food, water, shelter and electricity. The latter, in terms of the community, emphasised the individuals' ability to help themselves in order to realise development. Paramount to this was the economic activities that were believed to bring forth development as the community contributes to the GDP of the country's economy. However, contributing to the GDP

may not have much to do with people in the community if their economies are survivalist in nature.

The subject of development has been intensively researched from different disciplines such as social studies, economics and information systems. Each discipline draws what they assume will answer their research problem. This can be noted in the works of some authors such as Avgerou, Gxulwana, Monakhisi, Harindrath, and Okwanga. Its definition is rooted in each discipline, depending on which theoretical foundation the particular discipline is focused on. For instance, the theories, to name a few such as development, modernisation, dependency, contextualist, neo-institutionalist and social constructionist, play a large role in understanding the concept of development. With respect to ICTs, the relationships between development and ICTs are, to a certain extent, interdependent. ICTs can be used as a tool to reach some development goals (Brown & Grant 2010: 105, Ibrahim-Dasuki et al 2012: 37, Thompson 2004: 16). They assist in enhancing development drivers such as education, health and infrastructure (Ariyabandu & Zengpei 2009: 17). Harindrath and Sein (2007: 2) argue that the extent of success or failure of ICT interventions to enable development will depend on how national and local governments, national and international development agencies, non-governmental organisations and public agencies conceptualise ICT and development.

This study adopts Krauss' (2009: 16) description of development which states that development is a social condition and strategies that are aimed at enhancing people's lives. Development for purposes of this study will refer to any act that inspire and foster change in a community. Evidence of either personal or economic growth is another means to realise the development of people. Moreover, individuals' or communities are also at liberty to set goals that they believe will be reflective of development. With that being said development will not be prescriptive but rather communities will be the ones defining development for themselves. As noted above the change may be as a result of interaction with various development drivers such as ICTs.

2.3.1 Actors in development

Development is not an end in itself. For development to take place there are different actors and assets involved. These may be in a form of resources such as people, land,

infrastructure and finances. The key actors are people as they are the ones for whom development is targeted. The people here refer to women, men, learners, leaders and other important role players in the community. When they experience the effect of certain development goals, this implies that change is achieved. One way of measuring the achievements of such goals is through the use of the livelihoods framework as was defined in Chapter One, section 1.2.2. The challenge, however, is that there are risks involved that may deter people to use such available resources to improve their livelihoods. The assets themselves may turn into risks such as environmental degradation that would make it impossible for farmers to get produce from their land (OECD 2004: 3). The livelihoods assets can be used in development agendas as a guiding framework, principles or mere strategies to assist those embarking on the path of empowering the poor's livelihoods. In this framework, the assets are used in measuring whether a particular community is achieving its basic livelihood needs. The principles are meant to guide the implementation actions of the set development interventions (Toner 2003: 774). They further empower the poor in communities through a broad partnership of stakeholders (Toner 2003: 775). The strategies are operationalised as enforcers of interventions, or rather the actual application that can be used to measure livelihoods. For instance, food security is regarded as the outcome of livelihood strategies (Ziervogel & Drimie 2008: 205).

According to the Department for International Development (DFID), when people are placed at the centre of development, this increases the effectiveness of the development assistance provided (DFID 1999: 3). The people referred to may be individuals or the community as whole. The livelihoods framework identifies assets, which are viewed as useful in achieving development. The key components of the framework as illustrated in Figure 2.1 are human, financial, social, natural and physical capitals. The first asset, human capital, highlights the important elements that an individual should have in order to improve their livelihoods. This represents skills, training, knowledge and good health (DFID 1999: 19). Social capital as an asset enables an individual to be exposed to opportunities due to the networks that he or she has (DFID 1999: 21). The networks are established with a number of institutions that are willing to collaborate with the community (Ziervogel & Drimie 2008: 212). Moreover, these networks can be used for knowledge sharing and influencing policies that should benefit communities as well as managing community resources. Central

to the community assets is the natural capital which represents natural resources such as land and forestry which can be translated into economic activities to generate money for communities (DFID 1999: 23, OECD 2004: 3). For instance, provision of arable land to rural communities can help them to partake in agricultural activities.

For assets such as natural capital to be used effectively, certain resources are required such as physical capital. Physical capital is the basic resources and producer goods required to support livelihood (DFID 1999: 25). Producer goods are the tools and equipment that people use to function more productively. Essentially, this refers to infrastructure such as transport, secured shelter and building, access to water and sanitation, reliable energy and communication tools (DFID 1999: 25, Twyman & Slater 2005: 3). The last asset is financial capital, which is key in achieving the livelihood goal (DFID 1999: 27). This asset can either be in cash or its equivalent to pursue their livelihood objectives (OECD 2004). Finances are necessary for people to get training; acquire land and participate in agricultural activities; as well as access physical resources such as ICTs. The process of development is dependent on people's abilities to access resources (physical, natural and financial) that they will be able to use in order to improve their livelihoods. These are critical in improving their own capacities (human capital) as well as strengthening social bonds.

The application of the livelihoods assets is demonstrated in the work of Mbaiwa and Stronza (2010: 644), where communities in Botswana gained improved livelihoods from tourism activities. The availability of wild life (natural resource) in the studied communities enabled the community members to network and collaborate with private and government institutions and build community based organisation that assisted in managing the tourism development programmes (Mbaiwa & Stronza 2010: 651). Such networks (social capital) enabled the community to benefit from tourism through employment, income (financial capital) and social services, e.g. water supply, skills and scholarships to contribute in the livelihood of the community (Mbaiwa & Stronza 2010: 652). This further assisted in reducing poverty and outmigration for better opportunities.

Another case that applied the livelihoods approach proved to have been efficient in improving the community's livelihoods. The debate between product and process was

highlighted in this case. The CARE project in Tanzakesho, Tanzania, was based on the livelihoods assets principles of placing people at the centre of development (Toner 2003: 779). The project that had used top-down approaches then adopted a participatory method and was able to identify and address the problems at the core of the community's needs. The community and district officers were all involved in the project, signalling strong social capital. According to Toner (2003: 777), the project was effective as the community understood their problems better and played a role in coming up with the solutions to their problems. The possession of skills and knowledge are important in people to succeed in utilising physical and natural resources. Monakhisi (2008: 97) notes this when he says communities can participate fully in development only if they have necessary knowledge (human capital) and collateral (natural and financial capital).

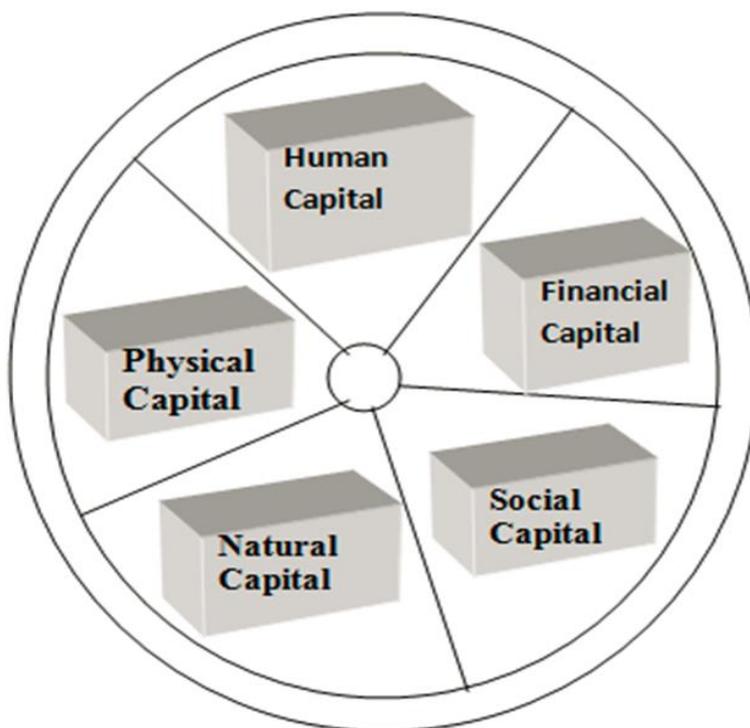


Figure 2.1: Livelihood assets

Source: (DFID 1999: 17, Tripathi et al 2012: 825)

2.3.2 Gender and development

Gender is of paramount significance in this study as women are at the centre of development particularly in South Africa. The inequities experienced by South Africans under Apartheid were more pronounced in women than their male counterparts. This is evident in the inclusion strategies proposed by some government departments.

According to the Department of Trade and Industry (DTI) (2006: 3), gender issues are not yet well integrated into other economic development strategies. As a result, gender equity has been observed as an economic issue that is critical in fast tracking South Africa's economic growth. In the context of this study, gender may play a role in fuelling the digital divide between men and women (Hafkin & Huyer 2007: 26). Women face different forms of discrimination including those of institutional actors such as financial ones (Kabeer 2005: 11). According to Molyneux and Razavi (2006: 20), by securing livelihoods and creating enabling economic conditions of women can play a significant role in attaining gender equality. The effect of gender discrimination is that it leads to limited access to education and work opportunities for women and girls (UNICEF 2006: 9). The preceding statement is also supported by Moyo (2013: 5156) where further argues that rural women in South Africa will continue to live in poverty for as long as they do not have access to land, education and health.

According to the European Commission (2008: 2), gender issues are central to the attainment of development goals and poverty reduction. The concept of gender can, therefore, play a complementary or a conflicting role in achieving development. According to Thomson (2007: 5), gender has an impact on the division of labour, distribution of work, income, wealth, public goods and services for women and men. The European Commission (EC), for example, notes that educating females can create a larger impact on the community (EC 2008: 2). Development can be delayed or not prevail in areas where women do not have access to some resources that were discussed in section 2.3.1. Development-related challenges, such as poverty, tend to affect women more than they affect men. This is exacerbated by the uneven distribution of resources by gender (Thomson 2007: 5). According to the United Nations Development Programme (UNDP) (2003: 1), universally, women are poorer than men. In some communities, women's control of resources is determined by social and cultural norms as well as factors such as women's access to labour markets (EC 2008: 4, McDade & Spring 2005). The prevalence of poverty and lack of access to paid employment, thus leads to women not accessing resources that aid development. The issue of skills and knowledge limitations, particularly in areas of starting and managing businesses, was reported to be more prevalent in women (Hassanin 2009: 59, IFC 2008: 14, Thomson 2007: 23). With such limitations, the process of development will be unequal in communities where such inequalities are still prevalent.

The nature of inequalities that arise from gender disparities can be detrimental to development. As a result, development needs to be exercised in a manner that will not widen existing gender inequalities.

2.3.3 Rural development

The characterisation of development, as discussed in section 2.2, was expanded to rural communities. Rural communities are areas that are sparsely populated, including villages, former homelands, small towns and they rely on natural resources (Gwanya 2010). Moreover, there is also reliance on labour migration and receiving remittances from family members who have migrated to the cities. Rural areas account close to half of the world's population (Nokia Siemens Networks 2007: 2, Saito & Okuda 2009: 23). Rural communities in the developing countries are at the forefront of inequalities in terms of access and distribution of resources. In South Africa, it was reported that that government departments do not prioritise rural communities when conducting development projects (Swanepoel & De Beer 2011: 7). As a result, urban communities, which are closer to the cities and some government departments, have access to resources and infrastructure as compared to their rural counterparts (Swanepoel & De Beer 2011: 8). Efforts were therefore made to fast-track distribution of resources so that the rural communities could catch up with their urban counterparts. According to Reed (2006: 191), the extension of infrastructure to rural communities enables such communities to access the modern economy. Access to resources and infrastructure also served as a measure against urban influx of the rural communities migrating to the urban parts seeking better living conditions (RSA 2000: 15). The concept of rural development was then systematised to facilitate change by enabling the poor to earn a living, invest in themselves and contribute toward their community's infrastructure (RSA 2000: 19). In addition, they would be able to identify opportunities and effectively act on them. Of interest to note is the emphasis on the ultimate goal on self-reliance, suggesting that community members would be empowered enough to create and preserve/protect their livelihoods.

The following key challenges were identified by the Department of Rural Development and Land Reform (DRDLR 2010b: 6, 7):

1. Underutilisation and/or unsustainable use of natural resources;

2. poor or lack of access to socio-economic infrastructure and services, public amenities and government services;
3. lack of access to water or water sources for both household and agricultural development;
4. low literacy, skills levels and migratory labour practices;
5. unresolved restitution and land tenure issues;
6. townships not formally established, thus, hindering service provision and development;
7. dependence on social grants and other forms of social security; and
8. unexploited opportunities in agriculture, tourism, mining and manufacturing.

In response to the listed challenges, the government of South Africa in 2009 designed a Comprehensive Rural Development Programme (CRDP) with the aim of addressing these structural challenges. According to the Department of Rural Development and Land Reform (2011: 1), the CRDP model has been implemented in over 60 rural wards. The initiative is said to be central to creating vibrant and sustainable rural communities. The model was also aimed at creating short-term employment through infrastructure-related projects and encouraging communities to start entrepreneurial activities (DRDLR 2010a: 7). Provision of skills to the community, particularly the youth, has been flagged as one of the means of making the communities to be sustainable (DRDLR 2011: 3). With the earned skills, youth could therefore be employed in their respective communities. It is reported that the National Rural Youth Corps that is associated with youth empowerment has employed 7,500 youth thus far (DRDLR 2011: 4). The success of rural development efforts has been expected to be measured through food security, rapid and sustained economic growth, intellectual development, environmental sustainability, healthy community, political maturity, social stability and growth, self-reliant and confident communities, fairness in line with Bill of Rights and social cohesion (DRDLR 2012: 120). However, most of these development markers have not yet been reached in communities, meaning the model is not effective. Research conducted in eight of the sites where the CRDP has been implemented reported that a small number of technologies have been introduced with only the privately-acquired ones being the sustainable ones (Hart et al 2012: 1).

In as much as rural development is dependent on, among other things, economic activities, it is important for these activities to be sustainable. The community should be able to grow or sustain itself on whatever economic activities they engage in. Monakhisi (2008: 76) argues that for poor communities to reach sustainable development they need to create linkages with larger and more sophisticated communities. Poor communities extending their markets to serve the large and sophisticated communities can achieve this. The basis of Monakhisi is valid, but to a certain extent, limits the power entrenched in such extension of services when he argues that they are merely providing resources for the elites (Monakhisi 2008: 76). The ability of these communities to serve such markets should be complemented as it reduces tendencies where the money from poor communities is being spent in affluent communities. In actual fact, this is economically good for these communities, as soliciting money from the affluent enables their local economy to flourish whilst decreasing poverty.

Rural development is argued to be dependent on the business activities of the community. Studies by de Koning (2010: 73) and Monakhisi (2008: 98, 133), for example, advocated for tourism in their targeted communities, namely Richtersveld, Graskop, Sabie, Hazyview, and Pilgrims Rest. Tourism-related entrepreneurship was what the community had as they were living closer to conservation protected areas of the Mpumalanga area. Monakhisi (2008: 99) argues that through such initiatives, communities will be able to reach development and have a sustainable livelihood. Communities who are therefore able to create such enterprises will also contribute to the economic development of their regions and the country. In some cases, community development is looked at in terms of the projects that are undertaken through external support. Such projects are explored in order to determine their sustainability and measure the impact they have to communities (Krauss 2009: 31, 35). This approach is sound and highly applauded, because reflections assist in determining whether projects that are brought into communities are making any progress to promote rural development.

2.3.4 Technology in development

There are various technologies in the market that are making people's lives and ways of doing things easier. These can be looked at from the infrastructural perspectives in

terms of roads, residential and commercial buildings, transportation, telecommunications and so forth. Shuman (2010: 185, 186) denotes these technologies that make life easier. Another area could be in terms of addressing daily social issues such as health and business issues (Jeske & Hommers 2011: 1, Krauss 2009: 4, Smith 2009: 79). The mechanisation referred to in section 2.3, such as farming machinery, is an example of some of the technologies that were introduced in people's lives. The technology in the health sector has led to management and treatment of some diseases such as malaria, tuberculosis and so forth (Gitonga et al 2010: 10, Smith 2009: 42). The level of agricultural produce is stated to have, in some cases, increased through hybrid technology (Heinberg 2010: 160, 161, Norberg-Hodge 2010: 177, Smith 2009: 27).

According to Kumar (2009: 29), decent jobs can be created in a context of improved productivity. Enhancing technological innovation, harnessing information and communication technologies, optimising energy systems, and improving staff performance and productivity can achieve this. Technology is further commended for assisting with transformations in remote communities. According to Ariyabandu and Zengpei (2009: 14), technologies such as WiMAX systems can cover a wide range of areas, such as communities around high mountains or isolated nearby islands. However, WiMAX technology is said to be expensive to deploy, but could work well in rural areas where there is no access to ICTs. Space technology is another field that promises to enhance access in remote areas. The VSAT, which is a two-way communication system using satellite, is more powerful, and can reach the underserved and geographically challenged areas all over the world (Ariyabandu & Zengpei 2009: 15).

However, for people to fully realise technological benefits, technologies should address their needs and be cost effective. IDRC (2006: 4) state that technology should be adapted to the local environment, taking into cognisance the issues such as language, literacy and physical access. It further advocates that the challenges should be defined through the eyes of the disadvantaged communities. When this is addressed, individuals or communities can then be connected to the telecommunication infrastructure. According to Jiyane et al (2013: 3), communities can use the information accessed through ICT application to identify and share job

opportunities. For instance, mobile phones can be used to access and share job opportunities with those who are looking for employment. As a result, the people will have increased exposure to job opportunities and as they get absorbed the unemployment rates will decrease and people's lives be uplifted (Jiyane et al 2013: 3).

ICTs as another form of technologies are of key interest to this study. The use of mobile phones and its services, such as Internet and related applications, is what will be investigated in this study. The next section looks into the relevance of ICTs in development.

2.4 ICTS' RELEVANCE IN DEVELOPMENT

The subject of ICTs' contribution to the developmental role in/for developing countries has received some attention on varying angles of engagement. The point of departure, as discussed in Chapter One, sections 1.1 and 1.2.3, highlights the focus on "for" and "in" development approaches. However, there are critiques to the existing literature that these approaches lack a theoretical base, which results in such research lacking rigour (Ibrahim-Dasuki et al 2012, Thompson & Walsham 2010: 3). Thompson argues that the developmental aspect of ICTs should not only focus on implementation of such ICTs in communities, but also on their usage in realising identified development goals. This argument is as a result of lack of indicators to show how particular ICTs are impacting people's lives. This study therefore elaborates on the importance of indicators in relation to ICTs in section 2.6.2.

The relevance of ICTs in development differs from one study to the next, depending on the focus. There are studies that report on the significant contribution of ICTs towards developmental purposes. For example, there have been some linkages on the ICTs' direct impact on the quality of life, education and health for developed and developing countries (Bankole et al 2011: 9, 6, Ngwenyama et al 2006: 8). From the ICT4D case studies, Krauss's 'train-the-trainer' initiative did not only train the teachers on how to use the computers, but also further reached the community who, in turn, had an opportunity to receive training on computer skills (Krauss 2009: 19). The identified challenges of skill shortages were countered by the training. However, it is

not all projects that foster such impacts. In some cases, the highly needed initiatives are unsuccessful due to a lack of pre-defined developmental goals or the understanding of community needs. In a study by Hulbert and Snyman (2007: 15), it was discovered that part of the reasons why ICT centres had failed in some areas in South Africa was because the communities were not consulted; instead, the needs were assumed without adequate consultation with the communities.

ICTs have the capability to contribute towards development. However, Thompson and Walsham (2010: 11) warn against being naïve that all ICTs can improve the lives of African people. They can, only if they are relevant and if they take cognisance of the societal structure of the community. This can be achieved by working together with the community members in order to solicit their developmental requirements and respond with appropriate ICTs. This should be done in a sustainable manner where the initiators of development do not necessarily have to be the drivers of such developments. By allowing the community to drive or participate in the ICT development initiatives provides them with the opportunity to understand what needs to be done to keep such initiatives running. This participatory approach will, in the long run, lead to sustainability. The failure of initiatives such as MPCCs (UN 2009a: 32) highlights the role that community participation can play towards sustainability of ICT initiatives. Successful cases have been noted in areas where the communities were involved throughout the process (Bailey 2009: 10). In cases where communities were not playing any role except that of consumers, the projects failed dismally (Hulbert & Snyman 2007: 15, Esselaar & Gillwald 2007: 26). Community participation is therefore important for development initiatives to be a success. The use of mobile phones is a success in communities because people have an upper hand on how to use these device. The mobile phone has been adapted by users to suit their needs and social conditions. For instance, in cases where network connectivity is poor, users subscribe to other providers to ensure that they stay connected (Boateng 2011). Such innovative ways of using the mobile phones shows the level of interest from users in this device.

To clearly understand the extent to which of these ICTs are impacting African communities, the next section will focus on what they have achieved in developing countries. This will be followed by the factors that affect the usage of ICTs. A

discussion on rural digital divides as a cause for access follows. The gender impact of ICTs is also discussed followed by sustainability of ICTs.

2.4.1 ICTs in developing countries

The priority of ICTs in facilitating development forms part of the United Nation's Millennium Development Goals (MDGs) adopted in 2000. MDGs provide a clear target of combating poverty, disease, hunger, illiteracy, environmental degradation and discrimination against women (UNDP 2002: 3). Goal eight of the MDGs stipulates that global partnerships for development need to be developed and should include accelerated transfer of technology and improved employment opportunities for the growing ranks of younger people in developing countries (UN 2005: 36). According to the United Nations (2006: 25), the target was to cooperate with the private sector to make the benefits of new technologies available to developing countries, especially ICTs. In this period, ICTs were growing in Africa (Asaba et al 2006: 144, Esselaar & Gillwald 2007: 91, Songan et al 2006: 85), with the mobile phone surpassing fixed telephone lines (Wafula-Kwake & Ocholla 2007: 38). Their growth is still soaring, with recent statistics showing that Africa's mobile phone adoption is at 65 per cent and in South Africa nearing 100 per cent (South Africa.info 2012: 1).

Smith (2009: 70) argues that no one should decide which technology is appropriate, especially if the technology is intended for the poor. He maintains that inappropriate technologies might be efficient in sustainable developmental conditions if applied appropriately. However, the appropriateness of technology cannot be determined by the providers of such technologies but by the users. These technologies can only be used "appropriately" if the users understand how these technologies should be used and for what purposes. The use of texting as a form of learning is one of the examples of how this feature empowered the community of Netreg in Cape Town. Elderly women used the texting feature to learn new forms of mobile phone communication whilst youngsters became their teachers (Dyers 2014: 9). The use of native languages, signs and reconstruction of sentences is a texting discourse that seems to work for users (Blommaert & Velghe 2012: 14) and demonstrates their innovative adoption techniques of using the mobile phone. For example, sentences are created as follows, the translation is provided as well:

“Btaal elke maand j rekening, gan rent office toe maak arrangement vetel wat j omstandighede is. Kyk hoeveel j ka btaal
(Pay your account each month, go to the rent office, make arrangements, tell them what your circumstances are. See how much you can pay)” (Dyers 2014: 11).

The text above shows the Afrikaans code of texting that have some English words as well. Thompson and Walsham (2010: 5) argues that ICTs can play a significant role of transformation in Africa by enabling public infrastructure, governance, accountability and civil society, entrepreneurship and economic activity, and access to global markets and resources. That being said, their research lacks examples that show how this has been achieved thus far, which would help build a strong case for their argument. This argument is drawn on the basis that when this literature survey was conducted, Thomson and Walsham could have identified papers that have implemented such resources. For instance, authors such as Pade et al (2005: 19), Smith (2009: 27), Wafula-Kwake and Ocholla (2007: 35), to name a few, have a published such articles.

People who live in rural areas need access to ICTs to gain economic and social benefits that technology can bring. Accessing and exchanging market information reduces rural isolation, and create market transparency (Saito & Okuda 2009: 29). For example, the e-Choupal project in India is another ICT initiative that improves efficiency in the agricultural sector in rural areas (Gollakota & Doshi 2011: 75). The initiative provides a social gathering space where people meet and use information technology to get information about the weather, news and market prices for their agricultural products. Through this project, farmers were able to transact, costs have been reduced from eight to two per cent, and the farmer price realisations have grown from 20 per cent to 25 per cent (Saito & Okuda 2009: 29).

The Internet is a popular service that is used to communicate and access all the online information. Users who used it in its early days were accessing it through computers. It can now be accessed on mobile devices such as mobile phones, personal digital assistance (PDAs) and Tablets. However, the use of some Internet-based communication mediums is facing some challenges as well. Communication is slowly

moving to social network services (SNS) and instant messaging (IM) services, replacing the electronic mail (email) channels of the Internet (InfoDev 2012: 38).

Although ICTs have their own challenges, they can assist rural communities to improve their social and economic lives (Ariyabandu & Zengpei 2009: 88). Various ICT devices and programmes are used for different needs and purposes. Their growth is also based on the users' needs. As ICTs become more prevalent, other devices tend to be less used in favour of newer effective ones. In a study of 13 African countries using ICTs for business purposes, it was noted that the usage of fixed telephone lines (FTLs) was slowly dropping, with mobile phone usage rising (Esselaar et al 2007: 90). The use of mobile phones recorded a difference of 48 per cent against 38 per cent of FTLs. With recent surges in mobile phone adoptions the difference could become much bigger.

2.4.1.1 Impact in the community

This section looks at the contribution of ICTs to the broader community of developing countries. Of great importance is what they have done for some rural communities or what has been predicted as what they could do for the communities. People who live in rural areas need access to ICT to gain economic and social benefits that technology can bring to them. The element of skills training was observed as an enabler for community members to be employable, including starting their own businesses (Bailey 2009: 7). Accessing and exchanging of market information reduces rural isolation, and creates market transparency (Saito & Okuda 2009: 29). It is also stated that the heritage of rural communities can be marketed to attract economic activities (UN 2009a: 27). This can be linked to the tourist business as mentioned in a Jamaican study where the community attracted clients through their music and culture, which was made possible by the telecentre (Bailey 2009: 8).

There were also links to ICTs' strengthening digital social networks within and outside communities, such as communication through social networks. The use of Facebook and other related services are used to connect people, irrespective of where they are. The use of telecentre by people from different tribes and areas were noted to have assisted the users to grow closer. According to respondents in Bailey's study (2009: 9), when they started visiting the telecentre people from different tribes were not talking

to each other, but they are now friends. To a certain extent the telecentres, contributed towards social integration.

2.4.1.2 Impact in education

This section discusses the importance of ICTs in education based on what they have promised and have achieved to date. The relationship between education as a developmental tool and ICTs is emphasised by Ngwenyama and his colleagues. They state that no one can operate a computer or have a meaningful access to information resources of the Internet for building new business, learning about democracy or more efficient methods about farming without having an education (Ngwenyama et al 2006: 8). The ICT devices themselves can be used to facilitate and provide basic education or literacy. The usage of telecentres in Jamaica, for example, was reported to be key in educating both the wider community as well as learners (Bailey 2009: 5). Telecentre services were used to train community members in basic computer skills (Bailey 2009: 5, Krauss 2009: 19). This was taken to another level where the computers assisted learners with their school homework through access points. In addition, literacy skills were also incorporated in adult training so that users could gain more knowledge (Bailey 2009: 7).

In an effort to integrate ICTs into learning, the then Department of Education in South Africa put forward an e-Education policy goal, which stipulated that all learners in general education and further education and learning should be ICT-capable by 2013 (Department of Education 2004: 17). This meant that ICTs were to be supported and used together with other existing forms of learner assessment (Department of Education 2004: 20). However, there are limited publications to show how the use of ICTs has been contributing towards learning in South African schools. The Khanya Project ⁴and Dr Maths are some of the learning tools used in public schools. Khanya uses computers to support learning for numeracy and literacy. However, it has been critiqued for not being accessible due to the large number of learner to computers ratio (Ford & Botha 2010: 5). The other challenge was that it did not reach most schools. Dr Maths, which uses the Mxit platform, is used to access tutors who assist learners

⁴ The Khanya Technology in Education Project, Western Cape Education Department.

with mathematics. Mxit is one of the mobile phone applications (refer to Chapter One, section 1.2 for a detailed definition). It also offers single-user text adventure games, multi-user arithmetic competitions, multi-user algebra skills competitions, multiple choice quiz competitions, and static lookups for information such as definitions and formulae to the learners (Butgereit et al 2010: 6).

Hollow's study (2010: 120) focused on a handheld learning aid, known as an Interactive Learning Machine, which was slightly larger than a mobile phone and able to play video and audio through either a loudspeaker or headphones. Most teachers were positive and keen to utilise this technology, reporting that they were thankful that the initiative had helped them adopt new and innovative approaches to teaching. The use of Interactive Learning Machine also proved to be useful for learners as it increased retention, attainment and improved the attendance (Hollow 2010: 123). However, this was not universal, and several teachers showed little interest as they were fearful of using the technology and reluctant to let the children use it independently (Hollow 2010: 124).

One of the challenges facing African schools as noted by Hollow (2010: 127) is the widespread lack of textbooks and inadequate access to extra-curricular learning materials. It is believed that ICTs can play a role in addressing this challenge. McKinsey and Company (2012: 12) cites the use of digital textbooks as a possible solution to that. He further states that the digital books will not only provide curricular textbooks, but will also offer multimedia-supporting material. The digitised textbook can be accessed through computers, laptops, tablets and mobile phones.

2.4.1.3 Impact in businesses

The use of ICTs in business may assist in improving the traditional methods of trading and transacting. The wider network, synonymous with the social media such as Facebook and Twitter, can be beneficial as well. This section provides examples of how different social networks are used for business purposes. According to Bailey (2009: 8), the telecentre did not only facilitate appropriation of skills, but also enabled the users to get employment. This was achieved by the telecentre managers offering references for the users as well as employing some community members. In addition, through the use of social networks, some community members managed to attract

tourists to their community and affording themselves tourism related businesses. The Hi5 [High 5] social network was used to secure visitors from England. The use of ICTs was recorded to have improved the turnover of the businesses surveyed in the study of Esselaar et al (2007: 95). Investments in ICTs therefore have proved to have some benefits as stipulated in Ngwenyama et al (2006: 8).

The use of Internet services can be valuable in terms of marketing businesses. The traditional method of advertising through printed pamphlets may be replaced by online distribution channels such as Facebook, Mxit, Twitter, Blackberry Messaging and WhatsApp (InfoDev 2012: 35, 36). Google was also cited to be used a great deal in researching trends applicable to owners' business. Moreover, Google was also used to compare prices in factories outside the Eastern Cape. Voice calls are cited to be preferred over other methods of communications as they provide instant feedback. This is particularly preferred when communicating with clients for requesting payments and/or informing them of requested services. In some areas the mobile phones provided them with business opportunities. The sales of mobile phone related services, such as selling pre-paid vouchers, assists in earning a living. This enables re-sellers to sustain themselves and their families (Macueve et al 2009: 26).

2.4.1.4 Impact in health

The use of ICTs can be seen in identification and management of diseases. The mobile phone, for example, has not only defined new ways of communicating, accessing news, banking and shopping, but has created a notion of dependency. The users are relying on it to solve problems that affect the local and global society. For instance, recent outbreaks of the deadly Ebola has led to technologists looking at how the mobile phones can be used help with the contact tracing of the disease and monitoring thereof (Keith 2014: 1). The author argues that it would be easy to manage Ebola using the mobile phone, as the device will enable rapid, real-time collection of data and motoring as well as an alert of new cases. This could also facilitate contact follow-ups. It has been noted that the mobile phone has been supporting isolated patients to keep in touch with their loved ones (TechChange 2014: 1). UNICEF is looking at SMSs as another means of sharing information on the Ebola disease. RapidPro and Tera are systems that support SMS distribution and have been used in the previous natural disasters such as the Haiti's 2010 hurricane disaster (IFRC 2013:

1). Tera was launched in Sierra Leone after the 2013 cholera outbreak. According to Sierra Leone's Vice President, Samuel Sumana, the 300 lives that were lost could have been prevented and saved (IFRC 2013: 1). The SMSs are used to send information on the prevention of diseases such as cholera and malaria as well as other natural disasters such as impending fires and floods (IFRC 2013: 1).

The use of applications such as SMSs has been used in other areas to communicate disease outbreaks and sharing information on how to manage some health conditions. For instance, in Uganda, the SMS is used to support maternal care. Information on how women should protect themselves and their unborn babies are sent to pregnant women (IICD 2013: 11). These messages were on how to care for themselves and the importance of attending prenatal appointments in clinics (IICD 2013: 11). In Mali, mobile applications were used for the diagnosis, prevention and treating malaria as well as preventing infant mortality (IICD 2013: 10). Other forms of ICTs in health include electronic management record (EMR) systems. EMR systems manage patients' health records electronically. They are cited to be efficient as they improve accuracy and saving nurses' time in manually retrieving and recording patients' data (O'Mahony et al 2014: 5). Bankole et al (2011: 10) states that ICTs' hardware and software enables health care workers to effectively and efficiently manage health care processes both preoperative and postoperative stages. Recent trends involve the use of Internet to get information on health related issues (Geana & Greiner 2011: 111).

2.4.2 Factors affecting usage

Gxulwana (2010: 38) discusses the concept of awareness as an enabler to ICT usage. She addresses the services, social and technical aspects that could enable or inhibit the usage of ICT. However, her discussion fails to distinguish different levels at which some ICT devices are dependent on this aspect. Devices such as mobile phones have proved to penetrate in communities where the aforementioned aspect of awareness was thought to be unachievable. The mobile phone device has broken social barriers such as illiteracy and poverty to a certain extent. Poverty refers to families who are living below the poverty line but do have access/own a mobile device. The technical barrier as cited by Gxulwana seems not to be a challenge for basic functionalities of a mobile phone. There is a need, however, to determine whether some features are not used because of services - social and technical hurdles.

Narayan and Nerurkar (2006: 34) argue that for ICTs to be adopted in rural communities, their content should be customized to suit local needs. The customization should be based on the needs and the spoken language of a community such that they can easily understand the content. They write about three phases that need to be accounted for when bridging the rural digital divide. Digital divide is a term used to describe the gaps that exist in accessing modern technologies that enable access to information particularly by rural communities (Sein & Furuholt 2012: 332, Wyatt et al 2005: 200). These gaps may be caused by demographics and socio-economic factors such as gender, age, education, language, and employment status (Armenta et al 2012: 347, Geana & Greiner 2011: 111). Infrastructural limitations are also a cause of lack of access in rural communities that are mostly not fully developed. As a result interventions towards bridging the digital divide involves infrastructural and technological solutions (Sein & Furuholt 2012: 332).

The three phases are: 1) the enabling phase, 2) awareness phase, and 3) diffusion phase. The description of each phase is provided below (Narayan & Nerurkar 2006: 35-39):

1. Enabling phase

This phase is more about setting up the infrastructure that is required for the technology to be able to operate. In terms of mobile phones, the infrastructure required may include network terminals to ensure coverage. This should be provided by the service owner who, in this case, will be the mobile network provider such as Vodacom, MTN, Cell C, and 8ta.

2. Awareness phase

For the service to be adopted and accepted by the targeted community, it should be aware of the service and the benefits that it will bring forth. The value could be on a social and/or economic level where the communities are taken through the benefits of using such devices or services.

3. Diffusion phase

After the infrastructure has been set-up and when the community is aware of such a service, diffusion can be determined by the uptake. The rural community will use the service, which will also show empowerment from the community's side as they use it more. Narayan further provides an example of communities in India that aggressively used e-governance services and therefore motivated the government to introduce more services.

Issues of access in some areas contribute towards ICT usage. In some areas, there are no infrastructural resources to support the uptake. According to Ariyabandu and Zengpei (2009: 23), there are many hurdles including infrastructure costs of deploying mobile access in rural areas. This is due to the fact that employing traditional methods for connectivity in large areas with low population density is quite costly (Mackey 2009: 2). The costs in some areas have been addressed by reducing implementation cost. The Global System for Mobile was used in areas such as India as access points. Some mobile producer companies that develop mobile phones reduced the cost of owning mobile phones by reducing the cost from US\$11 to US\$2 (Ariyabandu & Zengpei 2009: 23). This explains the increased ownership of mobile phones in Africa and their rural areas. Songan (2006: 87) highlights unstable power supply as another challenge of delivering ICT in rural areas. Poor electricity coverage leads to intermittent supply of electricity. Network connectivity is another challenge resulting from inadequate infrastructure. According to Esselaar et al (2007: 97), network problems and unreliable infrastructure are the most severe obstacles that affect ICT adoption.

Different services can be accessed at a telecentre, depending on the tailored service provisions of the people responsible for such initiatives. In some areas they were used to provide (electronic) e-services to improve the economic environment of rural communities (UN 2009a: 3, Bailey 2009: 8). On the contrary, a case study of Mozambican women shows that the telecentre that had the telephone, Internet and email facilities was used mostly for calling purposes (Macueve et al 2009: 28). In this case, the e-services as highlighted by the United Nations earlier were not explored by the community either for business nor personal gains. The limited use of the services was due to the high cost to be paid for accessing such services (Munyua 2009: 124). A similar concern was noted in Bailey's study where community members were

encouraged to use e-government services. The users thought that it was expensive to use the telecentre for their submission of government-related services and preferred going to the offices personally. However, the service providers mentioned that the community members were not aware that the amount charged was equivalent to the taxi fare to the nearest offices, and that using the telecentre would save them travel time (Bailey 2009: 11). The decisions for users to opt for voice rather than the email communication might have influenced the reactions.

Cost is a serious factor deterring people from accessing and using some ICTs. The use of computers and the Internet were recorded to be low in one of the African surveys (Esselaar et al 2007: 92, 95). The survey included several African countries namely Botswana, Cameroon, Ethiopia, Ghana, Kenya, Mozambique, Namibia, Nigeria, Rwanda, South Africa, Tanzania, Uganda, and Zimbabwe. In this study, the business owners complained that the devices such as computers are expensive. Although some could identify the importance of the computer, cost issues did not allow them to purchase the device (Esselaar et al 2007: 92, Modiba 2010: 113). The issue of cost affects informal businesses more than the formal ones, as informal business owners do not have access to external support such as banks and government institutions (Esselaar et al 2007: 95).

Some researchers associate the issue of cost to poor regulations, particularly in the telecommunications industry. The cost of voice calls and SMS is said to be higher in South Africa than in other countries due to the lack of strict regulations from institutions such as the Independent Communications Authority of South Africa (ICASA)⁵. Mobile data bundles were then introduced as an inexpensive alternative of accessing Internet. Data bundles are packages sold to users in a bundled mode to allow access to Internet (Kaneshige 2009). A certain amount allows the user to buy a number of megabytes (MB), for instance, in South Africa users can buy data bundles of 30 MB for R12 from MNOs such as Vodacom⁶. However, Internet access has been a challenge for many years. A number of people are accessing it using data bundles to minimize the costs.

⁵ ICASA regulates communications, broadcasting and postal services in South Africa, for more information follow this link: <https://www.icasa.org.za/>

⁶ Data bundle offered by Vodacom can be accessed on this link: <http://www.vodacom.co.za/vodacom/shopping/plans/plans>

The cost of data is still competitive amongst the five mobile network operators (MNOs), with Cell C and 8ta being cheaper (InfoDev 2012: 14). According to InfoDev (2012: 14), the two market leaders, Vodacom and MTN, are still more expensive even with the competition from Cell C and 8ta.

Part of the national strategy is to improve access and diffusion through effective regulations and competitive markets (NPC 2011: 24, 55). In managing the cost of communication some users have developed patterns of using SMS and voice in different times of the day. For example, the SMS is used to communicate during the day as it is considered cheaper at this time compared to voice calls. Voice calls are made in the evening after 20:00 as the rates are lower (InfoDev 2012: 36). The use of social media services such as Facebook, Mxit, and WhatsApp are now being used to save on both voice calls and SMS costs (InfoDev 2012: 10, 31)

Education is another factor that has impact on the use of ICTs. Educational levels seem to have an influence on the extent and intensity of how ICTs are used. According to Esselaar et al (2007: 93), the less educated users lack the knowledge of various devices and programmes that they can use. They give an example of businesses that did not know of accounting packages that could assist with their financial records. Alampay (2006b: 16) makes a distinction between the knowledge and the actual use. He argues that by knowing what devices or services are used for does not mean that those particular technologies are used. Therefore, there will be users who know and uses; know and does not use; and those who does not know and cannot use ICTs. The issue of awareness is also related to the problem as devices and services can only be useful when they are known.

2.4.3 Rural digital divide

The digital divide, as was defined in section 2.3.2 and Chapter One section 1.2.10, is a term used to describe the inequities of ICT access amongst different groups and geographic locations. The rural digital divide, therefore, refers to the unequal access between the rural settlements compared to their urban and suburban compatriots. The level of access to ICTs is lower in rural areas due to the infrastructural challenges affecting them (Alampay 2006b: 14). This would, however, differ from country to country. Ariyabandu and Zengpei (2009: 30) state that geographical conditions place

obstacles to achieve social and economic development, and create income gaps and the digital divide between people living in urban and rural remote areas. This can be observed, for example, in South Africa, where the spatial differences, resulting from the apartheid legacy, led to infrastructural imbalances for the residences of former homelands and dispersed villages that are mostly rural (Sikhakhane & Lubbe 2005: 5). The Integrated Sustainable Rural Development Strategy (ISRDS) points out that reaching these communities has been difficult, as many basic services were not provided for during the apartheid regime (RSA 2000: 17). The Nokia Siemens (2007: 4) research also argues that rural communities have been excluded from the benefits of ICTs because these services were not offered in a cost-effective way. Moreover, the growth in mobile services in the past few years was limited to urban consumers worldwide, hence the digital divide.

Things have changed as we now see rapid growth of mobile phone adoptions in rural areas. The deployment of telecentres was one of the approaches to reach to the rural communities (Ariyabandu & Zengpei 2009: 2, UN 2009a: 32). However, critics are still emerging with regards to the digital divide, as it is believed that now the divide will be amongst the well-off and the poor of these rural communities (Furuholt & Kristiansen 2007: 7, Rao 2005: 363). According to Krauss (2009: 29), the feedback that they received on their ICT training initiative conducted in a rural community of KwaZulu-Natal had concerns of the initiative potentially creating a social divide. It was feared that if there is no knowledge sharing and transfer to ensure sustainability, that could possibly later translate into a digital divide in the community. Hafkin and Huyer (2007: 33) cite access as a means to curb the digital divide. They further advise that the digital divide requires access and usage indicators disaggregated by socio-economic categories such as age, gender, income and location (Hafkin & Huyer 2007: 37). Recently the divide is caused by the accessibility of services. Various applications are developed for smartphones, leaving out mobile phones with basic features. The ownership of smartphones in rural areas is recorded to be lower, meaning that the communities are likely to be in this device-level digital divide (InfoDev 2012: 39).

2.4.4 Gender and ICTs

The issue of gender is brought into the ICT discussion due to inequalities that have existed and that continue to exist in some parts of the world. As a result, some women

are denied access to good health, education, the right to earn a living and access to financial services (Yudhoyono et al 2013: 34). With such limitations, the ability to afford and adopt ICTs could be affected. The diffusion and usage of ICTs have been cited by some authors as having gender inequalities embedded in them. For example, Narayan and Nerurkar (2006: 38) found out in their research that even though technology was neutral, some women lacked decision-making powers in households and the financial resources to utilise e-governance services.

Narayan and Nerurkar's findings are in agreement with Yudhoyono as observed in the first part of this discussion. It is reported that men may have more opportunities than women due to the role associated with each gender (Alampay 2006b: 10). The gender distribution of roles has left expectations that women will spend their monies towards household needs. Men, on the other hand, would use their money more towards purchasing ICT-related devices than groceries (Macueve et al 2009: 34). Household chores also took a lot of women's time, which meant that they had little or no time at all to experiment with ICT devices. On the contrary, from Bailey's study (2009: 7) it was noted that more women than men were attending computer literacy training offered at the telecentres. Reasons behind the men's low attendance were that they did not have time to attend classes. There are possibilities that they did not want to seem less knowledgeable than women (Bailey 2009: 7). It is interesting to note the stereotypes, "men being knowledgeable than women" emerging from these statements. However, in responding to the low attendance of men, the telecentre coordinators developed programmes that were related to sports and entertainment to be able to get the males interested in the training (Bailey 2009: 7).

According to Narayan and Nerurkar (2006: 38), through social awareness, gender, racial and caste biases may be eliminated. ICTs are the same tools that can assist to spread awareness (InfoDev 2011: 28). This has been argued mostly in the resource point of view where women were said to have limited interactions with such technologies.

Empowerment is important in making sure that gender does not contribute towards the digital divide. The concept of empowerment re-emerges in issues of gender as females have suffered tremendous inequalities, and processes of remedying this are

still in progress in some areas. The United Nations, for example, in addressing sustainable development, gives an example of how they could fail if they do not address these issues in a holistic manner. They state that by making medicine affordable and accessible does not necessarily reduce child mortality if women and girls are not empowered to learn about health matters (UN 2012: 16). Empowerment in the workplace has also been advocated as another means of empowering women so that they can be able to make meaningful decisions in their lives and the society. However, some women are paid less than their male counterparts for the same work (UNICEF 2006: ix). Such disparities in earning have their own impact towards ICT spending.

2.4.5 Sustainability of ICTs

Sustainability issues are common in most development initiatives, particularly the ICT4D initiatives. The ICT4D are actually receiving a great deal of criticism due to the lack of sustainability in the type of initiatives that are run in developing countries (Tabela et al 2007). According to Monakhisi (2008:45), the lack of sustainability on aid-funded projects is due to failure to build skills to take over when the intervention team leaves the area. Moreover, the cost of running the initiatives becomes unbearable as soon as the funding has been terminated. The United Nations (2009a: 32) gives an example of telecentres that are characterised by long-term sustainability problems due to their inability to survive when funders pull out. They report that these types of investments are, in most cases, not viable for private sector companies, hence the limited interest to continuously fund them. Self-reliance is cited as the driver to telecentre sustainability (Bailey 2009: 10). Moreover, this can be complemented by the telecentres' ability to continuously adapt to their community's needs as they change (Ariyabandu & Zengpei 2009: 21, Bailey 2009: 11). The services offered should not be rigid but flexible to accommodate the users as they evolve.

Sustainability is also dependent on the training that would enable the champions of the initiatives in the community to be able to sustain it. Songan et al (2006: 86) argue that ICTs should not be "dropped" into rural villages. This is evident in Roos et al (2008: 46) who reported about schools that received ICT equipment without receiving training, or schools that only received inadequate ICT skills training over a few days with no further support or professional development. ICTs need to be accompanied by

training and education so that they can be successful and sustainable. This can be achieved by making sure that the support measures are identified during the project design (Krauss 2009: 35). Other factors include awareness. ICT initiatives can be sustained if public awareness and demand is created (Ariyabandu & Zengpei 2009: 30). Moreover, active involvement of people in the development process can bring major improvements and sustainability (Getahum 2001: 118).

There are not as many issues of sustainability in the mobile phone front, as users mostly own the devices. The devices are also acquired on a personal decision rather than on an initiative basis. Of particular concern is the network infrastructure and reliability of service providers. Poor connectivity leads to unreliable and intermittent services which may affect users (Comfort & Dada 2009: 48, Msiska 2006: 247). Kruger and Mostert focused on the relationship of users and their MNOs. Their findings revealed that users tend to stay with their MNOs despite connectivity problems mainly because they do not want to keep changing their numbers (Kruger & Mostert 2012: 47). Moreover, contract subscribers were also encouraged by their MNOs to stay with such operators for at least two to three years, but that did not guarantee users to extend their relationship with the MNO.

Sustainability can be looked at in the form of services offered by the MNOs. For example, the local MNOs have been offering a "Please call me" service. The service is used to send requests to families and friends using various MNOs for them to call. This service is also used to communicate, where the service can be personalised by the user by means of input of text or message they want to relay. For instance, a personalised message can be as follows: "Please call in hospital". The receiver of the message will not only know that the user wants to talk to them, but also that they have been hospitalised. The MNOs offers between three and ten uses of this service a day. This is one example of mobile phone services sustainability. A noted possibility of some of the unsustainable services is the mobile applications. A mobile application (m-app) is a service that can be downloaded to a mobile phone device to be used for a particular purpose. InfoDev (2012: 18) defines m-app as software that runs on a mobile phone or on a server and interacts with mobile phones. In addition, mobile applications can sit either on top of an operating system or on top of a platform. Facebook is one of the applications that are used for social networking. InfoDev

validates the lack of sustainability in this statement: services or apps fail to take off because they are constrained by a lack of either widespread access or affordability (InfoDev 2012: 8).

The sustainability on a user side can be related to the handling of the mobile device. Damages and losing the mobile phone could be one of the effects. Losses can also be related to crime issues, where perpetrators may attack users in order to take the device from them.

2.5 MEASUREMENT TOOLS FOR IMPACT

Measuring impact can be done in the form of assessments and evaluations. According to the United Nations (2009a: 28), impact assessment is crucial in addressing questions such as *is, and how*. Access to ICTs provides benefits to individuals and communities they serve.

This study was undertaken to understand the same questions with respect to a mobile phone device and its effectiveness. Measuring the effectiveness of mobile phones may to a certain extent be a subjective issue. It can be assumed that if a smartphone is not used for its smart features, then that mobile phone may be ineffective. However, the unavailability of the service provider network will render the device not effective as more than one user will be unable to use it. In this case the ineffectiveness is not dependent on the users' full exploitation of the device, but rather the required supportive tools for possible functioning of the device. Ukaga and Maser (2004: 12) advises that when measuring effectiveness, time elements should be brought in. The time factor is further reiterated by the United Nations (UN 2009a: 36). From Ukaga and Maser's point of view, this will be based on the set period that a measured objective should have been achieved. They provide a medical example wherein they are asking whether the treatment provided to a patient worked. In this instance we assume that the evaluation will look at the period the patient took to respond to the treatment and if it correlates to be set objective.

Existing literature covers measurement primarily in terms of project initiatives as noted in the research of Bankole et al (2011), Gxulwana (2010), Hollow (2010), Krauss

(2009), Krauss (2012), Narayan and Nerurkar (2006), Parkinson and Ramirez (2006). This is understandable as most ICT interventions are set at an institutional level to address the challenge identified by such an organisation. Thus, when these interventions are taken to communities; they are packaged as projects so that the funding organisation can receive feedback based on the funder's goals and objectives. The type of assessment and evaluation will therefore focus on the funder other than the users' needs. As such, the long-term impacts are, in some cases, not measured. For instance, the United Nations (2009a: 1) states that to measure impact on education and training among the project targets is bound to be difficult when doing the assessment within the short period of time as these are long-term accomplishments.

2.5.1 Measurement in business

Positioning and strengthening a business is cited as one of the important roles of ICTs. This can be achieved by measuring the growth in the economy with respect to the GDP contributions from diverse industries of the country's economy (Labelle 2005: 37). Moreover, the ability to participate in trade and export of goods and services assist in measuring greater participation in the global economy. Labelle is alluding to the exposure that ICTs can bring to small communities by linking SMMEs to global markets. That being said, such great accomplishments should not hide the smaller ones. The rural businesses may become the suppliers of the urban businesses as such activities may illustrate the success through the use of ICTs. Porter, cited in Heeks and Molla (2009: 89) provides the areas to assist in determining the impact of ICT4D:

1. Low cost: does ICTs help the enterprise to reduce its costs (and, hence, the price of its products or services)?
2. Differentiation: does ICTs help the enterprise to produce some unique value that competitors do not?
3. Niche: does ICTs help the enterprise to successfully focus more on and meet the particular needs of a narrow market segment?

The three areas are supposedly drivers of competitiveness, as by successfully addressing these, the business will be sustainable. This will lead to the export element

as was mentioned by Labelle. Bailey has noted the areas of differentiation and niche in the study where one entrepreneur used SNS to reach the potential customers outside their country. The entrepreneur was able to market his tourist business to attract clients from England (Bailey 2009: 11). The measurement tool in this case is not only limited to the hardware device, but to other services which facilitated this whole transaction as well. This interaction was therefore made possible by the following: telecentre, computer, Internet, SNS and the entrepreneur's knowledge of the SNS and how to use all mentioned tools.

2.5.2 Measurement in education

The measurement of ICTs in education is discussed with reference to David Hollows' theses as his focus was solely on this topic. The conventional methods, such as cases studies, surveys and participatory workshops, of collecting data were used in Holloway's study to monitor and evaluate the impact of ICTs in schools (Hollow 2010: 170). Various (about 10) methods were used to complement each other ensuring that a greater depth and gaps were covered in cases where one method proved to be insufficient. In these conventional methods, Holloway incorporated pedagogical assessment methods in order to evaluate on whether learners' attainment can be quantitatively measured. The assessment for pedagogy used was: outcomes mapping; Action Aid Accountability; Learning and Planning Systems (ALPS); and Most Significant Change (MSC), which focuses on the process of learning (Hollow 2010: 75).

The capability approach was explored as well in measuring the impact in education. Similarly to ALPS, outcomes mapping and MSC, its evaluation was not only in ICT-related activities but of the learning processes as well (Heeks & Molla 2009: 38, Sen 2005b: 35). What could be drawn from the capability approach framework, however, is that it does not focus on a single aspect of measurement but rather a holistic manner in which education should be evaluated. According to (Unterhalter 2003: 218), one should evaluate the actual freedom or opportunities each learner has to choose and achieve what she values. This means that the focus should be on what learners are capable to do, what they choose to do and are able to achieve based on the choices made.

These brief discussions on business and education measurement provide an idea of how evaluation can be conducted on different areas. The upcoming subsections discuss the different measurement tools in detail.

2.6 CONCLUSION

This chapter looked at the development concept and how ICTs relate in this concept. Various approaches emerged, which influences the ICTs' role in development. Key areas identified were the ICT4D, which are concentrating more on the ICT initiatives, and which are brought to the poor in order to expose them to ICTs. The second one was ICTs in development that researches the impact that ICTs can have in communities. The last one was the combination of the two where the initiatives looked at how they are making contribution to the development of the society. This study took the last approach wherein active measurement of such interventions should be done to really address community issues.

Sustainability was discussed in terms of initiatives that are started in communities as a means to improve their lives and enable them to be part of the information society. It was further expanded to discuss services, devices, and applications that are dependent on sustainability to be able to benefit users. The widespread of mobile phones was discussed, taking into account the most preferred features. It was evident that the SNS are slowly taking over the preferred features such as SMS and voice calls. The affordability of the SNS was cited as the driving factor. Usage in terms of rural and gender was also looked at. The penetration of smartphones is still recorded low in rural areas, and this result in limited interactions with SNS.

The impact measurement tools were looked into and it became apparent that the effectiveness of mobile phones could only be evaluated when they are used. The time factor was highlighted to be valuable as it allows the measurement unit to be assessed on set period. Measurement approaches were looked into in areas of business and education in trying to understand what needs to be done when identifying measurement units. The capability approach was explored to see how it influences evaluations. It came out that the 'know how' is as important as having the device to use. Various frameworks and approaches were discussed on general usage and what

has been used in rural communities. The capability approach and sustainable livelihood framework were the ones that have been tried in rural communities. It also became clear that most frameworks are geared towards typical ICT4D projects. It was suggested that there is a need for a measurement tool that is not biased towards what ICTs should achieve, but rather that will focus on the user's needs. The next chapter discusses the theoretical framework of this study.

CHAPTER THREE

3. THEORETICAL FRAMEWORK

3.1 INTRODUCTION

The mobile phone has become ubiquitous in our communities. This has made it possible for people to have access to ICT benefits. The device is being used for many different reasons; some of which include communication and access to information. However, mobile phones bring with them many responsibilities, such as knowledge on how to use them, understanding the dangers that come with some of their applications as well as choices of which applications to use. These responsibilities are generally not known to users wherein their devices end up being underutilised or abused. This chapter focuses on how the mobile phone is used. It investigates frameworks that can be used to measure its effectiveness in rural communities. This is achieved by reviewing how the frameworks and methods used by other authors in similar studies or development topics.

In this chapter, three sections are provided to preface the theoretical framework. Section A discusses the usage of mobile phones in South Africa, looking at the device's advantages and disadvantages for a rural community. Section B then discusses the different frameworks and approaches that have been used elsewhere for the measurement of ICTs/mobile phones for development purposes. Section C examines how the discussed list of frameworks complements or fails to support the measurement of mobile phones in rural communities. The relevant framework is then proposed providing its benefits for the targeted communities. The next section will discuss the different usages of the mobile phones across communities, health, and education, their limitations and challenges. This will be followed by the measurement of impact in rural communities. The theoretical framework is then presented with the discussion on frameworks and approaches that are related to mobile phones and community development to assess changes. This is then followed by the analysis of the frameworks. The indicators for impact assessment are also discussed and the chapter is concluded.

SECTION A

3.2 BACKGROUND ON MOBILE PHONES USAGE

It is estimated that Africa is among the continents that will reach 20 per cent of mobile data traffic by 2015 (Cisco 2011: 5). According to GSMA (2014: 3), mobile phone subscriptions have been increasing at 18 per cent for the past five years, leading to 253 million subscriptions. Recent statistics reveal that the number of mobile phone users in Africa has multiplied by 33 since 2000 (Standard Bank Group 2015: 36). Moreover, it is estimated that in the next five years, every adult will have a mobile phone. In 2010, the Republic of South Africa (RSA) (2010: 116) reported that a percentage of South Africans with access to a mobile phone were rapidly approaching 9 out of 10. The total population coverage in mobile phone subscriptions is at 65 per cent (GSMA 2014: 5). Moreover, mobile phone subscription had increased from 18.5 per cent per 100 people in 2001 to 85.9 per cent in 2007, allowing South Africa to reach its MDG targets. Recent statistics revealed that more than 75 per cent of the less fortunate people, aged 15 years and older, have access to a mobile phone (InfoDev 2012: 24).

The percentage of those considered to be in par with the standard of living requirements is 89 per cent, suggesting that even the poor do have access to a mobile phone. According to InfoDev (2012: 24), 98.5 per cent of those who own mobile phones are using a pre-paid (pay as you go) Subscriber Identifier Module (SIM) card. Other reports have also reported multiple ownership of SIM cards (Boateng 2011: 57, Esselaar et al 2010: 4). Boateng stresses that the use of multiple SIM cards is due to the unreliability of network connectivity. The issue of high costs in terms of pricing is another reason for multiple SIM cards, as this allows users to have benefits of multiple MNOs (Esselaar et al 2010: 19). This behaviour indicates the users' capability in making sure that the mobile phone works to their advantage. Issues of network problems and high cost noted in Chapter Two, section 2.4.5, have led to users adopting means of ensuring that the mobile device continues to be accessible to them.

The versatility of the mobile phone device is further noticeable in how it overtook the FTL not only because of reaching those who had limited infrastructure for

telecommunications, but the service offerings as well. It offered the users more services such as SMS, Internet for smartphones and entertainment features; the mobile phone also offered increased mobility and lower costs (Esselaar et al 2007: 92). Generally, the mobile phone is used for making and receiving calls; receiving and sending SMS; receiving and sending multimedia messaging (MMS); chatting through instant messaging (IM); accessing SNS; taking pictures; recording videos; transferring and buying airtime; banking; surfing the Internet; playing games; listening to radio; and making and receiving video calls. It is said that the usage of these various activities is not too different between the less fortunate and the fortunate. The difference is that, in most cases, the less fortunate use these activities 10 per cent more than the fortunate (InfoDev 2012: 26).

Another noted trend in mobile phone usage was the ownership of high-end mobile phones. According to InfoDev (2012: 25) the less fortunate group has mobile phones capable of accessing the Internet. The access to Internet-capable mobile phones provides an indication of some new usage patterns such as surfing the Internet and accessing social networking services (InfoDev 2012: 26). Moreover, device ownership and some of its usages show the determination amongst people to sacrifice for services that they deem important. The usage patterns of those devices are, however, inconclusive considering that the results were enacted from a focus group.

The mobile phone's popularity is steadily increasing due to the device's ability to offer users various services at the palm of their hands. Smartphone devices take the lead compared to ordinary and feature phones. With the smartphone, users can easily access the Internet, SNS, banking and other services. The SNSs are competing with the SMSs as they are cheaper. Through mobile phone Internet access, users are enabled to send messages to friends, families and colleagues at a fraction of the cost of the other types of messaging (Donner et al 2011: 577).

The mobile phone business has the ability to spur local economy activities by allowing entrepreneurs to run their own mobile access businesses, such as offering pay phone services and selling airtime (Nokia Siemens Networks 2007: 4). The services of mobile phones contribute to business opportunities, as developers of mobile applications stand a chance of making money from m-apps. It is stated that the popular Mxit app

does not only make its money from subscribers, but also from advertising companies as well (InfoDev 2012: 9). Fifty per cent of their revenues are generated from subscribers and the other 50 per cent from advertisers. The total revenue is then split into 70 and 30 per cent for the developers and the company respectively. The high cost of data as stated in section 2.3.2 apparently impacts negatively on developers as they depend on this service for the development of m-apps (InfoDev 2012: 15).

In the health sector, the mobile phone assists with sending text messages to patients; for example, the mobile phone assists in sending test results or reminders about taking medications (Mall et al 2013: 365, Nokia Siemens Networks 2007: 4). Moreover, the alarm feature is used to remind patients to take their medications (Crankshaw et al 2010: 732). The IICD (2013: 4) further reports that rural health facilities and care workers use the mobile phone to disseminate information to the community. For example, the SMS feature was used in Ghana to share information on sexual and reproductive health matters. Moreover, the diagnosis treatment and prevention of Malaria are conducted through the support of mobile phone to fight the disease (IICD 2013: 10). In addition, the texting, image and audio features were used in the management of the disease. In South Africa, the mobile phone is used to control and monitor human exposure to Malaria through an application called *mipay* (Eskenazi et al 2014: 221). The incorporation of the mobile phone for health matters seems valuable and further commends the developmental role of this device.

Mobile phones are playing an incredible role in the learning environment as well. In education, the multimedia materials can be delivered into the classrooms via the mobile services (Nokia Siemens Networks 2007: 4). Moreover, they also assist in informal learning. According to McKinsey and Company (2012: 4), in India, primary schools used mobile phone games to help students from rural, low-income households to learn English. Researchers, with the assistance of teachers, devised a simple game to develop listening comprehension, word recognition, sentence construction and spelling. The test scores of students who used the mobile-phone games improved by nearly 60 per cent as a result of the mobile phone game. Furthermore, audio SMSs were used to learn English lessons in China, Bangladesh, South Korea and Indonesia. According to Cisco (2011: 5), such technologies helps to reduce boredom in classrooms and retain learners in schools, thereby reducing dropouts levels.

3.2.1 Mobile phone usage in South Africa

South Africa's high rank position, which is fifth in the world in data usage, illustrates an uptake of advanced activities done over the mobile phone other than basic calling services. The country is also leading in the continent in terms of application downloads from app stores (IT News Africa 2015: 1). This suggests that users are using the Internet to communicate and access different informative applications as well as content creation. They use their devices to download ringtones, music, wallpapers, pictures and screen savers (Hutton 2011: 1). They also take pictures and videos with their mobile phones (Pew Research Center 2015: 6). Facebook is the most popular SNSs used especially by those aged between 25 and 31. Since Facebook can be accessed over PCs, 85 per cent of users were accessing it from their mobile phones. The Facebook user base still has those who access the device from feature phones (World Wide Worx & Fuseware 2015: 1). In addition, the use of Facebook succeeded to close the gender gap as both male and females were accessing it equally.

Mxit is another popular platform claiming 62 per cent of users (Hutton 2011: 1). The platform seems to be on a downward trend as reports reveal that it had lost 1,6 million users by August 2014 (World Wide Worx & Fuseware 2015: 3). However, other IMs seem to be more popular when compared to SNSs. According to Effective Measure (2014: 10), the use of IMs such as BBM, WhatsApp, 2go, Mxit, We chat, Viber and MSN messenger, and email are more common than SNS. Moreover, WhatsApp is the most used IM followed by BBM (Effective Measure 2014: 11). According to Hutton (2011: 1), SMSs are still widely used especially to replace voice calls as they are more affordable.

Mobile banking is a service that is known, but people are less eager to use it due to limited knowledge of its benefits and the security factor around the service. Only a small number of the Nielsen study group reported to be using mobile banking (Hutton 2011: 1). Effective Measure (2014: 12) reports that 20 per cent of the smartphone users use mobile banking as a convenient feature of their device. The argument that smartphones enables its users to do banking is misleading as mobile banking can still be carried out on standard and feature phones of users who have a bank account and have registered for the service. Users with a standard or feature phone can use the unstructured supplementary service data (USSD) to conduct some basic banking

services (Standard Bank Group 2015: 50). The online purchase of goods and services is a new trend noticed from South Africans. A quarter of smartphones users was reported to have made purchases from their smartphones (Effective Measure 2014: 12).

YouTube and Instagram have become other applications that have stirred interest from South African users. According to World Wide Worx and Fuseware (2015: 3), YouTube's growth has increased to 7,2 million active users in a period of a year. Moreover, Instagram shares similar growth attributes as it has grown from 680,000 to 1,1 million users between 2013 and 2014. The growth of these content-based platforms suggest interest and possible content creation by South Africans. Twitter is one of the SNS competitors of Facebook. It has its presence in the South African market but not as much as its competitor, Facebook. Nevertheless, the intensity of its use is much higher than Facebook which means its users are more engaged on the platform than with Facebook (World Wide Worx & Fuseware 2015: 3). Moreover, LinkedIn, a professional networking platform is also slowly gaining numbers with a record of 3,8 million. This shows that mobile phone usage by the population is not only on a social level.

The various uses - from calls, SMSs, app and content downloads, to SNS and IM usage on various platforms - shows the growing use of the mobile phone. This further shows user trends that are appreciative of various applications that are brought to the market.

3.2.2 The importance of mobile phones in rural communities

As noted in the previous section, mobile phones have grounded themselves in terms of the services offered. The mobile phone's potential to reach markets which most ICT devices have failed to cover needs to be applauded. Their ability to reach the rural population market is explored further in this section. The recent trends on usage have grown to include social networking, and it is interesting to note how the trends apply in rural areas. Beger and Sinha (2012: 18) have recorded an exponential growth of Mxit users. Mxit is used for chatting; exchanging multimedia messages; playing games; download music; access movie clips and news; and buying and selling products contained in the app. In addition, the mobile phone was used to access

mobile banking application by rural users for business and personal uses. However, they have noted that there is limited hard evidence indicating mobile-banking access and use among populations disaggregated by age, location, race, and gender (Beger & Sinha 2012: 20).

Online usage trends reveal migration from computer access of Internet to mobile devices (UN 2010: vii). According to InfoDev (2012: 8), in a 2011 survey, there was a significant number of people who accessed the stripped-down mobile version of Facebook, Facebook Zero. This was accessed on feature or smartphones, or through the low-bandwidth mobile browser *Opera*. Young participants in the focus groups who have a feature or smartphone seem to use social networks and instant messaging platforms such as WhatsApp or BBM rather than voice and SMS services (InfoDev 2012: 30). Other features used, among others, are the mobile web, including mobile browsing; social networking or instant messaging; and are perceived as affordable. They are not only cheaper than a computer-enabled connection, but also cheaper than Internet café fees (InfoDev 2012: 31). Socially, the mobile phone addresses issues of safety. InfoDev (2012: 27) state that users felt that the mobile phone offered them and their loved ones a sense of security. An earlier study also revealed that the mobile phone was useful in cases of emergencies, as it is also used to contact the Police. The users felt that it increases their safety because when incidents happen at night they do not have to walk long distances to the police station (Macueve et al 2009: 26).

It is argued that certain features in the mobile phone, such as pre-paid packages, SMSs, missed calls and basic Internet services are the ones that attract rural people to use the mobile phone (Ariyabandu & Zengpei 2009: 16, UN 2010: 18). The SMS and voice features on the mobile phone are used by some people for business purposes as well (InfoDev 2012: 35). Furthermore, several businesses in the focus group discussions indicated that they use mobile applications, namely WhatsApp, Mxit, BlackBerry Messaging, Twitter and Facebook, to communicate with their customers and suppliers, and to advertise their products and services.

3.2.3 The impact of gender in mobile phone usage

The usage of a mobile phone by women from Tunisia, Jordan, Bahrain and United Arab Emirates, was nearly ubiquitous, with 79-93 per cent of women using it for

business purposes (CAWTAR 2007: 10). It was also used to access Internet applications. Internet usage was high, and this was found have increased by improved accessibility to mobile phones. However, some reports state that some women use mobile phones and Internet for personal and social purposes, unlike men who use them for professional reasons (Hafkin & Huyer 2007: 32). In Mozambique, women embraced the mobile phone technology as it enabled them to contact suppliers and make request for more stock (Macueve et al 2009: 26). The fact that it offered them direct immediate contact with suppliers was highly commended. This device was also viewed to be their “feet and work”. This means that it reduced their travels and also provided them with a business opportunity by allowing them to market their business using the mobile phone.

The mobile phone assists users to stay in contact with the loved ones. Relatives from abroad and those in the cities are contacted by mobile phone (Macueve et al 2009: 26). In cases where the users do not have food, they can call their relatives and request them to send them food (Comfort & Dada 2009: 50, Macueve et al 2009: 26). The mobile phone kiosks were used to redeem remittances received from relatives in the cities (Comfort & Dada 2009: 50). The payments were used towards buying food and other things that they needed. Through the mobile phone and being able to contact relatives, hunger was combated.

In contrary to the relationship aspect, a study by Munyua (2009: 123) reported that the mobile phone caused conflicts between spouses. Family feuds were caused by women’s concerns that their husbands spend more money recharging their mobile phone airtime than buying household essentials (Comfort & Dada 2009: 49). Overall, it was noted that women would give preference to their domestic roles and needs over their use of ICTs (Comfort & Dada 2009: 54). The other preferred feature of the mobile phone was the efficiency of the calendar and reminders (Munyua 2009: 124). Moreover, the mobile phone gave women a feeling of control, and it helped them strengthen networks with friends and clients.

With the noted efficiency associated with mobile phone, the study should also uncover the challenges related to the device. The next section discusses the limitations related to mobile phones.

3.2.4 Limitations of mobile phone usage in rural areas

Various authors have cited literacy and appropriate language as a challenge for people to use some ICTs (GSMA 2010: 88, IDRC 2006: 4, UN 2010: 99). The issue of literacy has now been expanded not only to address those with lower educational qualifications, but those with qualifications as well. ICT illiteracy has broadened to address the lack of know how in using ICTs. Kleine (2013: 74) talks about Internet illiteracy, which refers to a lack of knowledge on what is the Internet, how it is used and how it can be accessed. The work of InfoDev (2012: 26) indicates that mobile phone users in rural areas were not aware of the applications that are available due to lack of knowledge. They were still dependent on traditional media for information and basic usages of mobile phones for communication (Chiumbu 2012: 198). This clearly shows a lack of capabilities that exist in some rural communities. Hence 75 per cent coverage of mobile phones (InfoDev 2012: 24) and 80.2 per cent of access to Internet enabled mobile phones (Effective Measure 2014: 2) cannot translate into expanded usage of the devices. The barriers of language and digital illiteracy need to be addressed to enable optimum usage.

Network connectivity is another issue that causes problems with accessibility to the device. The high presence of the mobile phones in communities creates infrastructural burdens. According to Ganesan et al (2012: 368), mobile phone networks in rural areas are problematic. The more users connected to the mobile phone, the more the connectivity maybe poor in such areas (ITU 2014: 74) due to high demand. As such, users will not be able to get full access to the network coverage and that will affect their usage. In a study conducted by Nielsen, 27 per cent of mobile phone users migrated to a new service provider due to poor network coverage quality (Hutton 2011: 1).

The fact that the mobile phone is accessible to most rural people does not necessarily mean that affordability is not a challenge. In Chapter Two, section 2.3.3, it was mentioned that the rural population are vulnerable to a device digital divide due to the small concentration of such devices. The smartphones are generally not affordable; hence their uptake may not be similar to those areas where they have less pronounced socio-economic challenges. Those who own smartphones are mostly on contract, which means they can afford them. This is affirmed by Effective Measure (2014: 6)

when stating that 65.7 per cent of smartphone users subscribe to a contract package. The cost element is also a challenge for those with standard phones. According to the UN (2010: 35), the mobile phone services are sometimes high, especially for the less fortunate. As such, some services may not be accessible to them due to cost implications. Community members have adapted new ways of using the device even when they do not have money. For instance, the use of *Please call me backs* as a way to alert others that they are in trouble or they need them to contact them (Chiumbu 2012: 201).

3.2.5 Challenges related to mobile phones

The nature of mobile phones is such that it is an easy target for criminals. This can occur either through theft or hacking conducted by cyber criminals (Eskenazi et al 2014: 220). Also, it is easily accessible to everyone, thereby exposing children to content not relevant to them and the cybercriminals as well. Users of the device are also susceptible to spyware that can corrupt their devices as hackers use viruses to tap into their private information (Cortez 2015: 20, 23, Marett et al 2014: 55). In response to such threats, mandatory registration of SIM cards have been introduced to manage crime and fraud (Jentzsch 2012: 609). However, in some instances, this may lead to privacy infringement due to a detailed profile of the user, especially if the user does switch to other operator (Jentzsch 2012: 209). The mobile phone is quoted to have increased laziness amongst people as more time is spent on them than doing other physical activities (Cortez 2015: 19). According to Meschtscherjakov et al (2014: 2325), this shows attachment to the device as the user is now spending limited resources such as time, money and energy on the device. It is further noted that the mobile phone encourages plagiarism by scholars, and makes some rely on platforms such as Wikipedia for knowledge, which is open to criticism in terms of trustworthiness of what has been documented (Sharples et al 2007: 21). The mobile phone is used by others as a status commodity, especially amongst the youth (Abeele et al 2014: 206). This has negative connotations, especially for those who cannot afford to live up to such standards.

SECTION B

3.3 MEASUREMENT INSTRUMENTS FOR IMPACT ASSESSMENT

The proliferation of ICTs in rural communities brings with it different benefits and challenges. The mobile phone carries with it the ability to foster development in rural communities where infrastructure had been problematic (Smith 2009: 124). These communities that struggled to have access to ICTs are therefore provided with an opportunity for access by this device. As a result, to fully understand their effectiveness in the lives of users, it is of utmost importance to have a way to measure their impact. With measurement tools, both users and service providers will have knowledge on areas that they need to improve on as well as problem areas that may need to be corrected.

Indicators play a crucial role in the measurement process, as they are what will be used to see whether there is an impact. Indicators are described as the measuring devices that define the type of data that needs to be collected based on the time interval (UN 2009a: 29). They are also valuable in reflecting collective values as they show specific actions required and demonstrate progress to the community (Ukaga & Maser 2004: 14). According to the United Nations (2009a: 2), indicators should be developed as soon as project targets have been identified. This means that they would be less dependent on the preconceived project results (UN 2009a: 35). Indicators can be best achieved when there are markers to say an impact will be achieved if a particular action is met: for instance, in the case of mobile phones, when a user is able to use the Internet to look and apply for jobs. The “apply” can be used as a marker to qualify the indicator “look for a job”. The use of indicators can also assist in identifying the changes that are un-intended, as not all the desired markers may be achieved (UN 2009a).

Indicators are not the only tools used for assessment and measuring impact. There are various measurement models and frameworks that have been produced in order to measure the impact of ICTs. A majority of these tools are designed for ICT4D projects, although they are seen as not being sufficient by Heeks and Molla (2009: 1).

Random generic measurement tools are scarce due to the fact that most researchers focus on what is beneficial for their organisations or discipline. This can be noted in the research of Alampay, Krauss, and more. Some lack the holistic component of addressing various development issues, but are still relevant to their focused area (Kleine 2013: 81). However, such tools have not been used in the rural settings of South Africa as well as on devices that community members acquire on their own.

The following sections discuss frameworks and approaches that influenced this study, and show how some are being used in the proposed matrix.

3.3.1 Capability approach (CA)

Capability approach (CA) is a framework that looks into people's capabilities and freedom to lead the life they value through the choices that they make (Sen 2005b: 35). With the growth of ICTs, the framework has been used to also focus on the uptake and the patterns of how ICTs are being used (Heeks & Molla 2009: 31). Alampay (2006: 11) argues that the traditional measurement of access to ICTs needs to evolve to focus on human development rather than tele-density indicators that are mostly used (ITU 2008, 8). The effectiveness of ICTs in our communities is dependent on various aspects that may not be linked to access as discussed in Chapter Two, sections 2.3.2, 2.3.3 and 2.3.4. The research work of Amartya Sen points out capability as another dilemma for people experiencing the freedom to use ICTs (Sen 2005b: 5). People's freedom to express or share is not possible due to not being capacitated. In his capability approach, it is clear that access in itself may not lead to individuals using the resources at their disposal. ICTs may fall in the same cloud of being underutilised due to lack of capabilities. In a qualitative research conducted by Gxulwana, participants had access to the Internet through their mobile phones. Gxulwana (2010: 89) then argues that if the users had necessary skills/capabilities to create content, local content would be created and shared over the Internet. As a result, this would emphasise the relevance of such ICTs for development in rural communities. The argument of Gxulwana is valid in that one of the limitations for Internet is unavailability of local content (Asaba et al 2006: 150, Pryor 2006: 11). ICT users, particularly those in rural communities, need to reach a stage where they are content producers.

According to the United Nations (2010: 91), the use of ICTs requires capabilities such as literacy, as well as financial and other resources that are not universal or equally distributed. The capabilities in Alampay's (2006b: 14) research shows that urban people are more capable than those in rural areas; educated more capable than less educated; younger more capable than older; richer more capable than poorer. Access and usage will therefore be determined by different factors ranging from gender, income, education, age and location that will impact people's capabilities and freedoms to choose certain ICT devices. Walker (2003: 177) concurs by stating that education is important in developing capabilities, but that will not predetermine anything that may lead to functionality. In her view, structural inequalities may not provide opportunities for a woman or girl child to access some aspects of ICTs (Walker 2003: 188). Not only access can help assess the status quo of ICTs in communities, but also the functionalities are also important in determining impact. Alampay (2006: 15) further stated that it is not enough to simply determine whether people have the capability to access and use telephones, mobile phones and the Internet (whether at home, office, or public places). It also requires understanding the purpose and reasons for why people use ICTs and the ends they are able to achieve with them (Alampay 2006b: 15). It is evident that the issue of access is much broader than merely having the devices. It also requires knowledge and skills to enable capabilities.

Alampay's application of the CA focused on intrinsic aspects that are required in terms of using ICTs that he terms values, capabilities and functionalities (Alampay 2006a: 7). Values are the things an individual aims to achieve, which are considered important to them (Sen 2005a: 5, Sen 2005b: 35). The capabilities refer to being able to achieve such values, through availability of resources and having the freedom to enhance their choices. The ability to perform towards their values enables them to achieve their values that are then considered functionalities. The capability approach has been viewed as important in assessing the impact of ICTs (Bailey 2009: 14, Gxulwana 2010: 42, Ibrahim-Dasuki et al 2012: 42). In expanding the same approach, Alampay added income, location and skills or education as the determining factors on an individual's ability to choose to use ICTs (Alampay 2006b: 13-15). Figure 3.1 illustrates the approach as proposed by Alampay. People's choices are based on their capabilities. Their capabilities are twofold; on the one hand they should have knowledge and/or experience on which ICTs to use. They should also know how to use such ICTs. On

the other hand, capabilities can be realised when individuals have access in terms of appropriating ICTs. According to Alampay (2006: 15), functionality needs to be understood in terms of the purpose of using ICTs, why they are using them and what ends are they achieving by making such decisions. When the capabilities are achieved, the actual usage of ICTs will be realised, and this would mean the individuals have reached good functionality. High functioning can only be realised if the achievement is of what is valued by an individual (Wilson-Strydom 2011: 409).

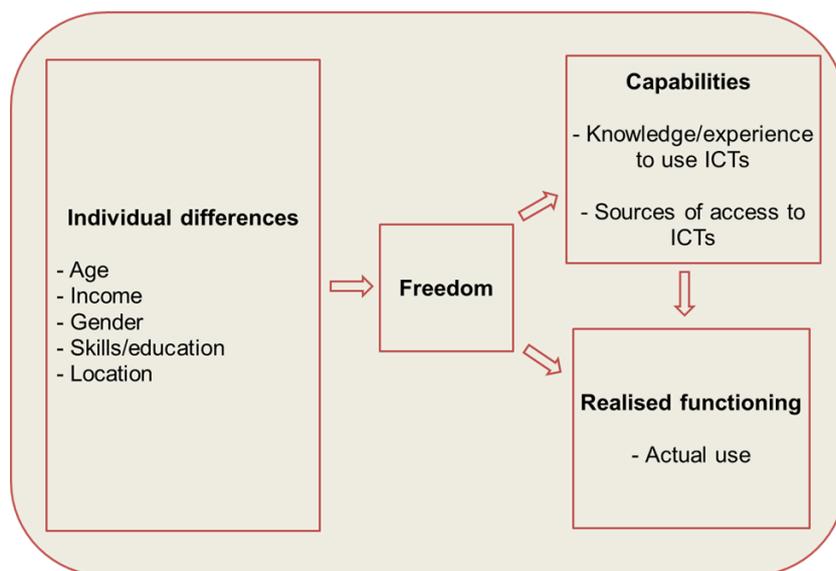


Figure 3.1: Capability approach applied to ICTs access

Source: (Alampay 2006b: 15)

Functionalities can be used for evaluations, although Unterhalter (2003: 218) advises that this should be done against the level of capabilities of the evaluated subjects. Moreover, with CA one can only evaluate the actual freedom or opportunities.

The CA carries with it a number of advantages for the South African rural users of mobile devices. The aspect of access is contentious, whereby the users' capabilities and functionalities are overlooked when assessing usage of the devices. Most report on access, for example, a focus on the robust increase in numbers of subscribers, overlooking the cases where one mobile phone device is shared by many. CA can therefore assist in understanding the complex issues of access from the users' perspective and assist in determining functionings that drive new ways of usage. The

'know how' emphasised by CA can be valuable in understanding the use and non-use of some applications for example the highest uptake of Facebook compared to Twitter.

3.3.2 Gender evaluation methodology (GEM)

The Gender Evaluation Methodology (GEM) framework is intrinsically interested in gender element of the ICTs' impact measurement. GEM is the framework that can assist in understanding the use of ICTS by gender (Heeks & Molla 2009: 96). It has four levels, which are used for assessing impact. Level one only looks at women. Level two focuses on both women and men. At level three, the process incorporates impact on resources, roles and relations, bearing in mind the gendered nature of roles and distribution of resources. Level four uses all the impact markers for levels one, two and three; and brings to the picture institutions and organisations which influences gender norms, values, attitudes, structures of ownership and power as well as practices. Whilst it is important to focus on the aspects that affect access, the framework does not have exact levels of usage of the ICTs.

The framework may be valuable in general access of resources, including those of ICTs, but it cannot be employed to usages of ICTs. Valuable lessons can be drawn from this framework, which is to take cognisance of gender when evaluating the impact of ICTs, particularly of mobile phones in terms of this study. The nature of use of different applications per gender may help in identifying and understanding reasons behind such usage patterns. For instance, the use of applications such as Facebook by a specific gender may reveal their level of exposure to mobile application. Usage trends will assist in understanding the level of exposure to knowledge a particular gender holds.

3.3.3 Sustainable livelihoods framework

The sustainable livelihoods (SL) framework is at the centre of the rural communities' basic needs. It is not a framework that can be used to assess the impact of ICTs, but it has capabilities to support the assessment and evaluation processes. The livelihood framework was adopted by Tripathi and colleagues to illustrate how it functions within the ICT spectrum. According to Tripathi et al (2012: 825), ICTs impact on the livelihoods assets in various ways depending on the context in which they are applied. The mapping of how five assets (refer to Chapter Two, section 2.3.1) of the framework

can be impacted by ICTs is well addressed in that they can support the improvement of people's lives. The support factor is elaborated by Duncombe (2007: 93), when he states that ICTs can provide data concerning key indicators of livelihoods. Moreover, they can also provide information that supports policy implementation, thereby contributing to monitoring and evaluation. In other words, ICTs should be able to assist with monitoring and evaluation of policies that contributes to community livelihoods. In contrary to the issue of support, Parkinson and Ramirez (2006: 5) argues that the framework can be used for impact assessment purposes. They believe that the framework is comprehensive and may assist evaluators to understand the impact of ICTs in a bottom up approach. This can be achieved by assessing these questions (Parkinson & Ramirez 2006: 5):

- In what ways, positive, negative or neutral, are ICTs in the context of a specific project likely to interact with different livelihood strategies?
- Which demographic groups within the population are most likely to use these strategies?
- And thus, who is most likely to be impacted by ICTs, and in what ways?

In their assessment of the impact of a telecentre, results revealed that the telecentre was mainly used for communication purposes. The use of the Internet to improve economic conditions was not considered at all by the community members as per the study's assumptions (Parkinson & Ramirez 2006: 2, 9). Moreover, the people who used the telecentre often were students and the educated community members who were doing well economically. The framework is broad and should be used to optimally assess the key requirements of the research problem. The study of Parkinson and Ramirez did not use all of the assets in the SL framework. The assets that come out strongly in their analysis are human and financial capital. The framework did, without any doubt, assist in understanding the community of Aguablanca very well, but did not provide the impact assessment of ICTs to the broader community except for a few (Parkinson & Ramirez 2006: 8, 9). In cases of broad based projects, the framework fits nicely as most assets of the framework will be used to assess the livelihood impacts that are at the core of any developing community. However, when assessing and evaluating specific ICT devices, the framework can be underutilised, thereby implying that it is not a good assessment tool. For instance, the financial capital asset in relation

to the telecentre in Aguablanca did not seem to make any significant contribution to community members who were leading economical unstable lives (Parkinson & Ramirez 2006: 5). The point of reference in terms of measurement is not present in both the research of Tripathi et al as well as Parkinson and Ramirez. This demonstrates that the SL framework can be best used for support purposes with other assessment and evaluation tools.

In the context of South Africa, the SL framework can work if adapted to fit certain communities. The framework can be used in identifying the assets that are in congruent with the studied community. For instance, with this study's targeted community, the assets that would apply are those of natural, social and human capital. These would be relevant in mapping the community's social fibre and pointing out different aspects of the community's uses of the mobile phone to connect and empower itself. The SL framework's weakness in this community is that there are no financial, and physical resources to help measure the impact of mobile phones.

Adapting some of the frameworks to suit a new environment is not always practical as was discussed in section 3.3.3. The SL framework is not suitable for the researched community and cannot be adapted to be used there. Only two assets can be assessed in this community that are not sufficient to assess access, usage of different platforms and most importantly the financial implications.

3.3.4 Qualitative and quantitative methods

Qualitative and quantitative research methods are some of the tools used for the evaluation of impact. It is said that quantitative evaluations mainly focus on the intensity of the predetermined benchmarks based on indicators (Manda 2014: 5). They, however, fail to measure long-term qualitative changes relating to popular empowerment, feelings of self-worth, awareness, attitude change, happiness, inclusion, participation, and gender relations which are the focus of the qualitative evaluations (Manda 2014: 6). The difference between the two methods is that in quantitative methods it is easy to measure whilst qualitative ones are difficult to measure as it might take time to notice the change. Qualitative evaluations can be achieved by listening to the stories of the community members and enacting the changes experienced (Davies & Dart 2005: 38). Manda (2014: 6) states that the best

way to measure impact would be to use the current progress on what is being measured against the previous status quo. This means that at each interaction the evaluator will have to mark the participant's progress so that it can be used against the next evaluation results. The use of both methods has been proved to be beneficial in measurement studies. For instance, in the study by Beers et al (2006: 319), both methods were used to assess the effectiveness of the Ntool. A qualitative method was used to gain insight into the respondents' response to the cognitive learning system whilst quantitative method was used to determine the baseline and the forecasted results.

These methods are beneficial for the South African context especially where a suitable language is used to interact with the researched group. The communities have a strong oral culture, which means it is easier to get them to talk about their experiences. The only weakness with these methods is with quantitative aspects, as there might be a need to get someone to administer the questionnaires for some communities due to literacy issues. The presence of the administrator may also help in explaining concepts that are new to them like Twitter.

3.3.5 Most significant change

Most significant change (MSC) is one tool that resonated with qualitative methods of conducting evaluations. It is an evaluation tool that recognises the community members' stories as a source of data to track change (Davies & Dart 2005: 22). This technique is advocated by Lennie and Taachi (2013: 32) due to its emphasis on community members' participation and significant change stories. The MSC evaluation tool does not use indicators to measure, as it is assumed that indicators measure activities. They use stories only governed by 'who' 'what' 'when' and 'why' (Davies & Dart 2005: 8). The stories are good in a sense that they can inform the evaluator of the changes. However, this leaves the user of the measured device to be dependent on the evaluator for assessment and for tracking change. Although it is stipulated that the user is responsible for defining their own indicators, only the evaluator is able to enact the actual change out of the identified domains (Davies & Dart 2005: 10). This cripples the user's power in monitoring and evaluating their own progress. Although indicators are referred to as activities (Davies & Dart 2005), they

guide the user on how to measure their progress in terms of the changes that they are assessing.

There are differences between indicators that are provided by project owners and those that are developed together with the community stakeholders as reported in the work of Lennie and Taachi (2013: 8). Indicators are useful in defining or reaching outcomes (UN 2009a: 35). Davis and Dart, although not in favour of indicators as stated in the preceding discussions, agree that indicators are important for the monitoring and evaluation process (Davies & Dart 2005: 59). Indicators do not need to be deductive, but can be used to capture both the expected and unexpected outcomes (Beers et al 2006: 326). The MSC is undoubtedly suitable for project related initiatives as it is targeted at organisations (Davies & Dart 2005: 15). Interpretation of stories is left to the evaluators, which leaves room for conveying wrong messages or answering organisational questions rather than addressing people. MSC stories can be valuable in evaluating the outcomes whereby impact assessment can be done by evaluating the stories on what changes have been noted and why they are considered essential by users (Davies & Dart 2005: 82). The diagram below illustrates how MSC is employed within a project environment whereby the annual review checks on whether the program logic is in line with the MSC.

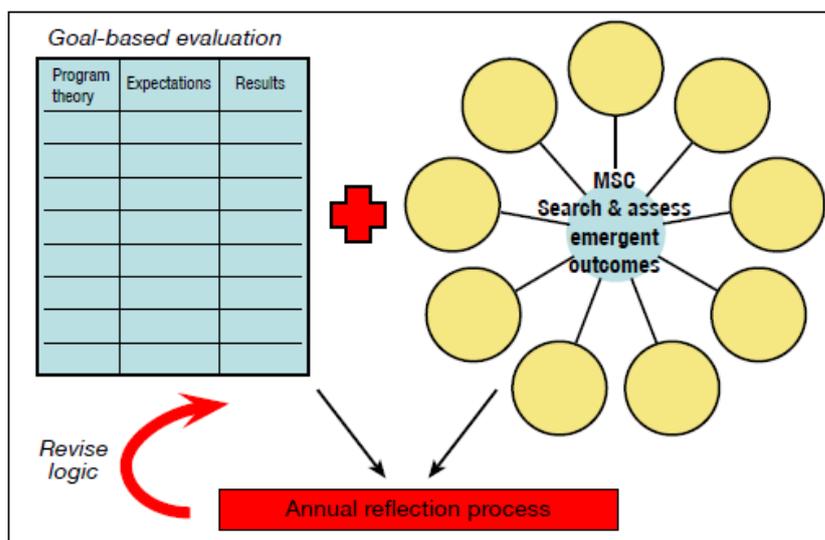


Figure 3.2: MSC project logic

Source: (Davies & Dart 2005: 83)

In their future research recommendations, Davies and Dart (2005: 87) suggest that MSC should be experimented on deductive approaches, something which this study attempted. Interviews were carried out to gather different experiences with the mobile phone. The users' experiences were later used to extract indicators that were used to assess the impact of the mobile phone in the lives of users. Therefore, the use of indicators in this study was not like in a common project oriented self-developed yardsticks to measure impact. These were inductive indicators deduced from the 'stories' (case study interview results) of community members. The MSC's only positive aspect for a context like South Africa is the collection of stories to use them for evaluation. However, the evaluation process itself cannot work as it follows a project approach rather than a community approach with different users and devices.

3.3.6 Conceptual framework to measure impact of mobile phones on micro-trading

Boateng, in his research of microenterprises, proposes a conceptual framework to measure the impact of mobile phones on micro trading in Ghana. The framework was developed through data collected using mixed methods such as surveys and case studies. According to Boateng (2011: 57), the impact of mobile phones was measurable with the traders experiencing 90 per cent in incremental benefits. The noted benefits were in communication with customers and suppliers; easy access of information; record keeping and economic empowerment (Boateng 2011: 57, 58). The framework is illustrated in Figure 3.3.

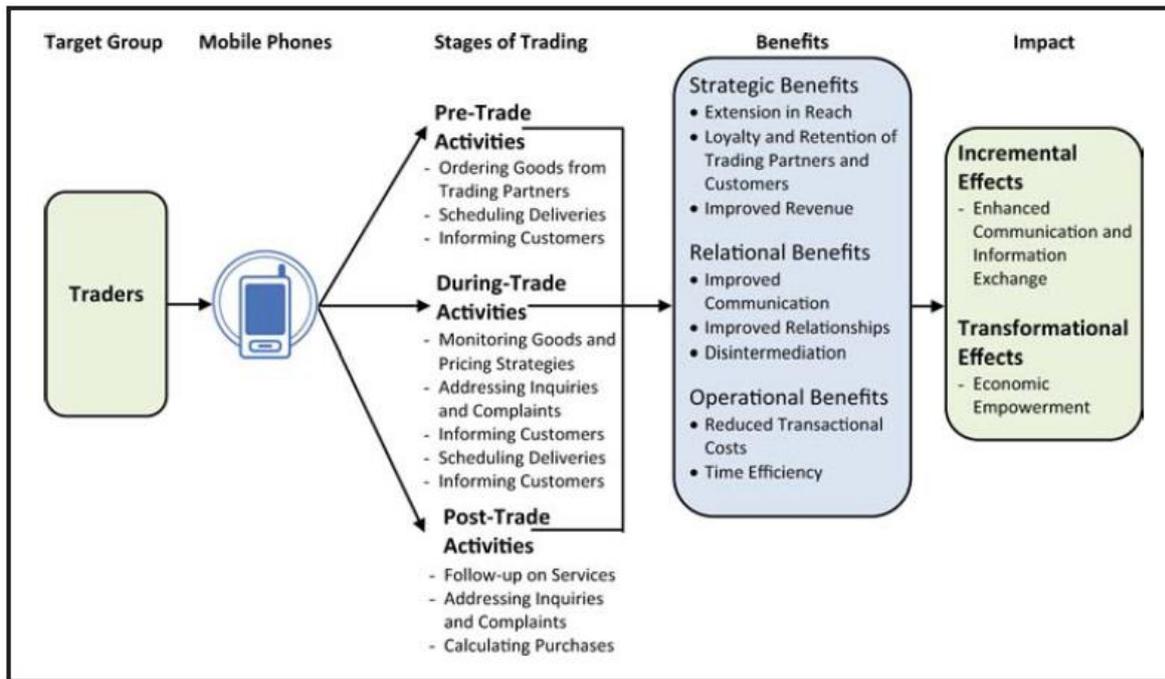


Figure 3.3: Impact of mobile phones on micro trading activities

Source: (Boateng 2011: 58)

The framework is not broad enough to encompass other groups that reside in a rural community, and thus presents limitations in terms of using it to evaluate other groups. The author as well did not show how the framework could be expanded to cater for non-business groups within a rural community.

3.3.7 A framework for analysing mobile learning

This framework focuses on a holistic view of measuring mobile learning. Mobile learning framework (MLF) looks at the interaction of people with technology artefacts to derive how the learning process is achieved. According to Sharples et al (2007: 12), the semiotic and the technological framework should coexist and complement each other in the learning process. They further state that learning in recent days happens in different environments and often influenced by mobility brought by mobile devices (Sharples et al 2007: 2). Therefore there is a need for convergence between what people learn in different contexts and also draw from what others have learned in different communication platforms (Sharples et al 2007: 4). Thus, technology will provide a shared conversational space that can be used by individual learners, learner groups and communities (Sharples et al 2007: 8). As illustrated in Figure 3.4,

technology is at the top of the framework where resources interface with each other. The object is the subject matter that the learners will discuss for their different contexts.

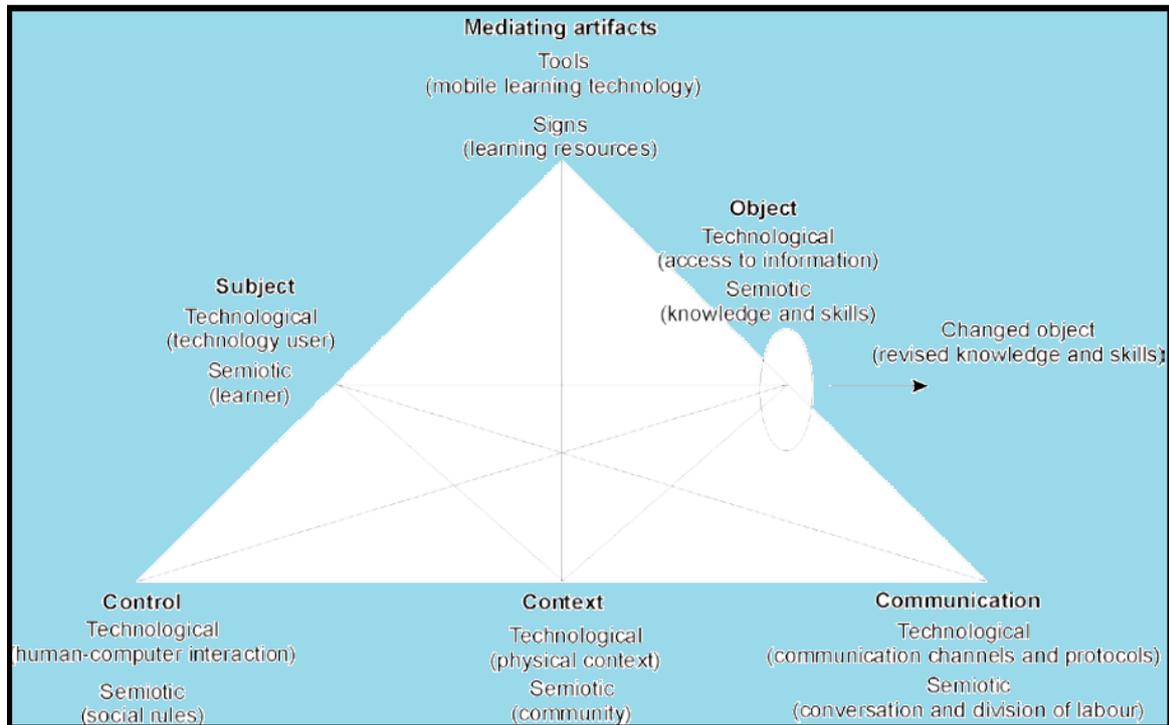


Figure 3.4: Mobile learning framework

Source: (Sharples et al 2007: 12)

The mobile learning framework encourages collaboration and an opportunity for people to learn from each other. It is interactive and may be used in communities through SNS platforms. The evaluation process of this framework encompasses qualitative and quantitative data collection processes. Evaluation is conducted on the technological and semiotic level to understand the dialectic changes experienced on a particular learning environment (Sharples et al 2007: 19). The framework emphasises learning which occurs through conversations and negotiation (Sharples et al 2007: 22), which makes it non-flexible in terms of allowing other emergent learning forms where ICTs are involved. For example, progressing from sending SMS only to emails cannot be captured as gained knowledge. It is therefore focused only on a specific learning process.

The rigidity of this framework may make it difficult to use in South African communities because learning can only be evaluated on conversations and negotiations. The inability to incorporate other technological platforms defeats the sole purpose of using

technology as a mode of learning. In a ground level, conversations are useful, but with learners' important valuations may be missed if all the platforms they use are not used for measurement. The technological footprint in classrooms and communities is not that good in South Africa for people to rely only on specific tools (for learning). The educational system's structure of learning where the mediator is the teacher and the curriculum set by the department contrast with the open learning suggested by MLF. It can, however, be beneficial for non-formal learning. Its strong point though is the emphasis for people to learn from each other.

3.3.8 Social network analysis (SNA)

This social change analysis framework is aimed at evaluating social networks (Davies 2009: 3). These networks refer to different actors that are involved in the communication process. The framework is also inspired by the emergent high number of social networks that resulted from widespread of ICTs and uses software packages for analysis (Davies 2009: 3). Of importance to this framework is the actors' attributes and the structure of their networks (Davies 2009: 4). The framework provides a visualisation of how relationships are structured, and it is also argued that the networks are much better than matrices due to their ability to illustrate big data (Davies 2009: 7). The visualisation aspect is one that this study can learn from in terms of presenting large data sets. However, the network can be seen as complicated, see Figure 3.5, in terms of making sense of the portrayed messages/information. As a result, Davies (2009: 14) proposes the use of a matrix together with the network diagram to convey details in a complementary form. This can be achieved by collating data into the matrix and later export the data into an excel sheet and produce a network diagram (Davies 2009: 17). Although the framework is targeted at both individuals and organisations, its purpose is mainly for the networks of interactions and their structures only. It cannot be used for any other evaluations except those of communication and structure.

The SNA seems to be relevant for analysing complex relationships made up of various actors. In terms of this study, it can only function where the wider community assessment is done. On an individual level, it would not make an impact as the connection of relationships to others is not as important as the person's connection to the mobile device. Determining the level of interactions with various SNS and IM

platforms would have been a great asset if SNA could achieve that. However, this tool is more on a high level to achieve such detailed extractions.

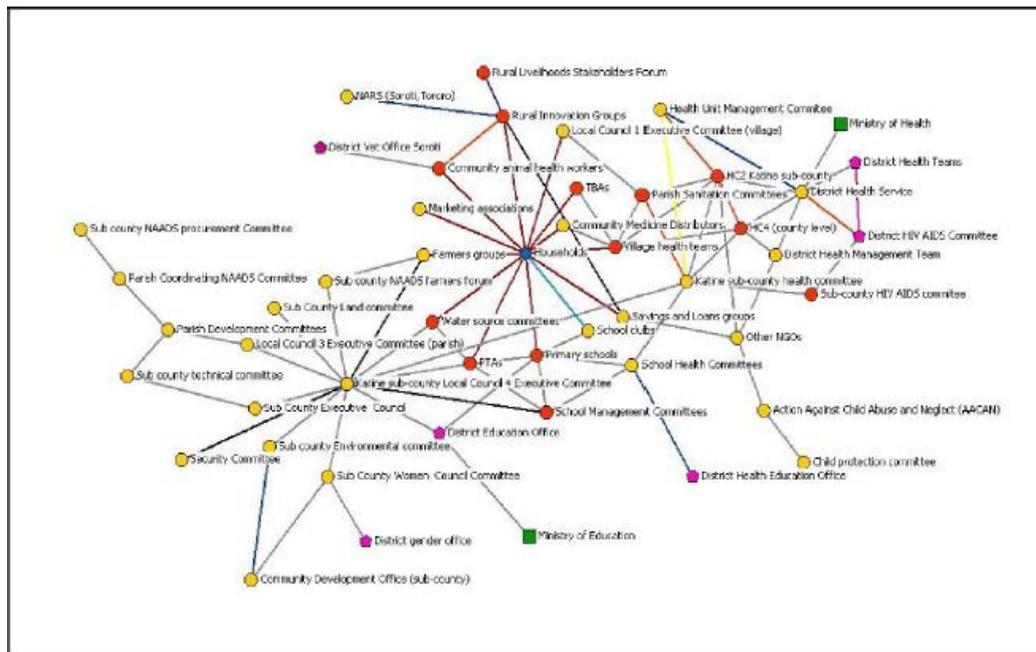


Figure 3.5: Social network analysis framework

Source: (Davies 2009: 12)

3.3.9 Communication for development framework

Communication for development (C4D) framework is an evaluation tool designed by Lennie and Tacchi. The framework, although it is for communication, was designed to evaluate the communication processes that are aimed for social change development projects using participatory approaches (Lennie & Tacchi 2013: 3). The reason this study looks into this framework is that it does not only use ICT devices to ensure coverage of various topics and communities, but it also focuses on social change as well (Lennie & Tacchi 2013: 4). Similarly to MSC, it is outcomes-based and seeks both the expected and unexpected results as a means to measure impact (Davies & Dart 2005: 59, Lennie & Tacchi 2013: 4). The framework brings with it some valuable lessons as it emphasises participatory methods in the collection and evaluation of communication processes. The participatory approach is also an important aspect of this study (refer to Chapters One and Two sections 1.2.2 and 2.4); it foregrounds the importance of community involvement in the development process and assessing the impacts resulting from development driven artefacts.

Another strong point of the C4D is the use of mixed methods for research and evaluation (Lennie & Tacchi 2013: 36). This allows it to cover various issues that most methods may not capture in their evaluations. The C4D encompasses in it the communicative ecology. It is these aspects of the framework that underpins the focus of this study (Lennie & Tacchi 2013: 27) and emphasises the elements that the study is researching. The communicative ecology was drawn from Hearn et al (2009: 31) whereby the communication aspect is evaluated by understanding the devices used, how they are used and why they are being used. The C4D framework is targeted at organisations that are mostly working on development initiatives, and this is evident in the amount of work where it has been tested for United Nations projects (Lennie & Tacchi 2013: 14).

The C4D framework's strong focus is on how communities and development agents communicate. It can be beneficial in understanding how different mobile phone applications are used for communications. However, it is a tool that is relevant for organisations. It is more suitable for long-term evaluation projects and cannot, thus, be advocated for social change programmes that are targeted at individuals who are agents of their development assessment as the proposed matrix of this study.

SECTION C

3.4 ANALYSIS OF ASSESSMENT AND EVALUATION APPROACHES

There is a number of frameworks/approaches for measuring the impact of ICTs. Some may be relevant for the South African context whilst some may completely not be applicable. Others may only be relevant if they are adapted to suit the South African context. Capability approach is another powerful assessment tool. It has the capacity to separate resources and people's capabilities as a means to assess impact. Unlike MSC and SL frameworks which uses what is either provided (resources) or perceived activities as units of measurement, CA focuses on the underlying challenges that limit potential users from achieving optimal use of their resources. This approach reminds evaluation practitioners that there is more to usage than what is perceived. For instance, the person's ability to use a particular application is dependent on their freedom of choice and understanding the importance of choosing such an application. However, often people use applications because of their popularity, not fully understanding their intended purposes. The mobile phone, for example, is used by some for only making and receiving calls due to the lack of knowledge of other applications in their devices or how they can benefit from them. The CA's ability to address such matters is relevant for the developmental aspects of the mobile phone.

The use of various applications is dependent on knowledge of how such applications are used for and how to utilise them. Gender can serve as a determining factor on usage due to low educational exposure which women, for example, are mostly affected. As such, gender can be used as an indicator in evaluation to determine how in a certain community's men and women use certain applications. Cost is another key factor to distinguish gender access and roles that may impact the usage of applications. It is therefore important that from the GEM framework, the aspect of gender be taken into consideration for this study's matrix as it may provide rich data analysis in terms of understanding the targeted community's interaction with mobile phones. As it was noted in section 3.2.1 that Facebook's use in South Africa reached gender parity. This illustrates equal access opportunities in terms of gender. However, as important as the GEM framework may seem, communities cannot be measured

only on gender indicators, as there is more to different communities than gender equality.

In addressing the holistic nature of rural communities, the SL framework provides five assets that are supposed to cover the assessment process. However, some of its assets are not measurable in some communities. Section 3.3.3 shows how the framework failed to address the ICT assessment of the entire community in Aguablanca. Similar issues are pertinent in the South African rural context due to its socio-economic status. For instance, how does one use financial capital to measure the issue of cost in communities that have extremely high unemployment? The only assets that are of relevance in the researched community are human and social capital. Financial capital, however, could be considered in terms of decisions to buy a mobile phone. Applying the SL framework in the targeted community is not effective as a majority of assets are not completely applicable or their applicability is very complex.

There are similarities between some of the frameworks though applied in different contexts. Qualitative and quantitative methods, MSC and mobile learning framework share similarities in using conversational outcomes to determine if some form of learning/change has occurred. For instance, MSC framework is one of the assessment frameworks that focus on individuals' stories to measure impact. It is a good framework in the sense that technologically-based frameworks may disregard the intrinsic benefits that users experience when measuring the actual use of stories. Frameworks such as mobile learning and SNA are examples of the technologically focused assessment tools that only measure extrinsic elements. Similarly to qualitative methods, CA can reveal the most abstract impacts of evaluations.

For MSC to be effective there is a need to create guiding instruments to discern meaning and indicators. Nevertheless, the challenge with this framework is that it does not use indicators, refer to section 3.3.5. Indicators are important in this study's context as they help to identify and define outcomes of what is being assessed. As such, this method cannot be adapted to suit the context, as it will result in irrelevant stories that would not enable the researcher to measure the effectiveness of mobile phones.

Qualitative and quantitative methods will however to be incorporated to help in collecting the users' current experiences and desired expectations if any.

The C4D is another framework that is used for assessment. The shortfall with this framework, however, is that it is only interested in the evaluations of communication in a structural level. It focuses on how reporting is done and advocates for a participatory linear process of communication rather a top-down approach. The use of mixed methods for evaluation is important but it is only tailored for ICT4D related assessment. This makes it inefficient for individual assessments. The use of mixed methods was also noted in Boateng's conceptual framework. The method seems to be effective as it enabled Boateng to measure the impact of mobile phones on micro traders. This framework also talks to the needs of this study but it was not sufficient as it was designed for traders only. Boateng also failed to show how it can be expanded to cater for different needs of a rural community.

There are noted similarities between the frameworks and approaches discussed in section 3.3 above. This includes the use of different methods to conduct the assessment or the evaluation. Table 3.1 shows measurement tools that are being used in the measurement of ICTs. Other studies used participatory methods to ensure that communities are involved in the processes of evaluation. However, these frameworks had limitations that would make it difficult to use in the case of a rural community in South Africa. What can be noted from the discussed assessment frameworks is that they were not all applicable but were addressing only a small aspect of measurement.

A holistic and agile assessment tool is what is advocated in this study so that it can fit any South African context. It should thus be agile enough to allow different users to customise it to their own context. From the discussed tools, only the CA, qualitative and quantitative methods are covering some aspects of how measurement can be efficiently done on mobile phone usage. The reported usage trends and challenges in section 3.2 calls for an analysis of how cost is managed especially in the use of applications like Facebook when 'please call me back' is known to have been favoured as it enables users to reach to other parties when users do not have airtime to initiate

a call. Nevertheless, there are valuable lessons learned to be incorporated to the proposed matrix of this study, and they are listed below:

1. Capabilities and functionings are important in assessing the impact (Unterhalter 2003: 218).
2. Use indicators that arise from community member's needs, not those that seem relevant from the evaluator's point of view (Davies & Dart 2005: 17, ITU 2014b: 75, Lennie & Tacchi 2013: 37).
3. The use of multiple methods enhances the evaluation process (Hollow 2010: 188).
4. Qualitative and quantitative methods can complement each other in the evaluation process (Beers et al 2006: 326).
5. Participatory methods are important to involve communities (Lennie & Tacchi 2013: 25).
6. Design a holistic and flexible framework that can address various issues that may be relevant for assessment (Kleine 2013: 82, Lennie & Tacchi 2013: 26, 17).
7. Stories can be beneficial in identifying unexpected and unintended impacts (Davies & Dart 2005: 49).

Measurement tool	Purpose	Device	Area	Target
Capability approach	Using people's capabilities to enable them to use the tools they have at their disposal	Any device	All areas	All
Gender evaluation methodology (GEM)	To measure the ICT4D impact on men and women based on their roles	Manual	All areas	All
Sustainable livelihood framework	Protect people from vulnerabilities of poverty by using the assets available to them	Manual	All areas	All
Surveys	To measure impact using either qualitative and/or	Any device	All areas	Organisations

Measurement tool	Purpose	Device	Area	Target
	quantitative research methods.			
Most significant change (MSC)	To monitor and evaluate social change projects and programs	Manual	All areas	Organisations
Conceptual framework of the impact of mobile phones	Measure the impact of mobile phones on micro trading	Mobile phones	Businesses	Individuals/ companies
Social network analysis (SNA)	To analyse the structure of relationships between actors	Any device	Health	All
Communication for development (C4D)	To use communication tools as a means to achieve social change whilst enabling dialogue between community members and those fostering development projects	Manual	Areas that have communication aspect in them	Organisations

Table 3.1: Assessment and evaluation tools

Source: Owner

The CA was also consulted in developing the matrix as the capabilities and the freedoms of an individual enables them to achieve their goals or not. The matrix, similarly to other frameworks discussed above, was developed through the use of mixed methods to identify relevant indicators and to conduct assessments. Surveys, interviews, and participatory research were used whereby the developed indicators and matrix were validated by the targeted users.

3.5 CONCLUSION

This chapter discussed mobile phones and how they have closed the infrastructure gap and increased communication levels. The mobile phone was used to support

learning and health interventions. In as much as the device simplifies different areas of people's lives, some limitations and challenges related to the mobile phone were discussed. The time factor was highlighted to be valuable as it allows the measurement unit to be assessed on set period. Measurement approaches were looked into in different areas to understand what needs to be done when identifying measurement units. Various frameworks and approaches were discussed on general usage and what has been used in rural communities. It came out that the 'know how' is as important as having the device to use. The CA and sustainable SL framework were the ones that have been used in rural communities. However, they had shortfalls to be used alone in a context of this study. It also came clear that most frameworks are geared towards typical ICT4D projects. The theoretical framework was presented, analysing the impact measurement tools, and it became apparent that they were inadequate to measure the effectiveness of mobile phones in a rural community of South Africa. It was suggested that there is a need for a measurement tool that is not biased towards what ICTs should achieve, but rather that will focus on the user's needs. Of the discussed frameworks, several lessons learned would be considered in the development of the matrix. Some of those include using indicators that are suggested by community members and involving them in the evaluation process.

The next chapter discusses the historical overview of South Africa and the researched community of Phake Rebone.

CHAPTER FOUR

4. HISTORICAL AND CASE STUDY OVERVIEW

4.1 INTRODUCTION

South Africa has been through structural changes, some of which include colonisation and apartheid. These have implanted inequalities, racial and ethnic divisions as well as unequal distribution of resources. The inequalities brought by white supremacy continue to haunt many poor black South Africans. This chapter looks at South Africa as a developing country and how it managed to deal with developmental matters once reclaiming its freedom. The current state of affairs is discussed, including how the community studied in this research fits in the political and social structure of this country. The chapter further provides an overview of the community of Phake on how it fits in all these structural challenges. This is achieved by discussing the nature of the selection that deliberates the motivation behind the chosen area. Thereafter, the case study description will present the socio-economic landscape. This will be followed by the ethnicity, culture and the political background of the community. After this, a section that describes the constituency of the surveyed group will then follow. The chapter will be concluded by a summary of the key discussions of the overview chapter.

4.2 HISTORICAL OVERVIEW OF SOUTH AFRICA

South Africa is a former colony in the southern part of the African continent. The country has a population group of 51,8 million (STATSSA 2012a: 14) distributed over the nine provinces namely, Cape Town; Eastern Cape; Gauteng; KwaZulu-Natal; Limpopo; Mpumalanga; Northern Cape; North West and Western Cape. The history of South Africa also includes those who are regarded as natives, the Khoikhoi and the San people who currently live in the Kalahari desert (Pereltsvaig 2012: 117, Giliomee & Mbenga 2007: 117). According to Giliomee and Mbenga (2007: 17), the San were mostly a hunter-gatherer nation, but this changed slightly when they met the Bantu speaking farmers and acquired cattle, goats and sheep from them. The San who

became herders were then referred to as Khoekhoen, also known as Khoikhoi (Giliomee & Mbenga 2007: 17). These were the first people who had contact with the Dutch colonisers, and in the process suffered detrimental losses of land, cattle, social structure; and tragically died from small pox and other diseases that came with the colonisers (Frye et al 2011: 239).

Giliomee and Mbenga (2007: 22) further state that other South African occupants were the African Bantu-speaking farmers from Central, East and West Africa who were farmers in 1700 AD. Moreover, they were travelling eastwards and southwards in search for iron ore, grazing land and rainy regions for their crops. Amongst these groups there were the Nguni group and Sotho-Tswana groups (Giliomee & Mbenga 2007: 28). The former settled on coastal areas, surviving on hunting, gathering and farming on livestock. The latter settled inland towards the middle of South Africa where their livelihood depended on trading, cultivation and livestock.

4.2.1 Colonisation in South Africa

The history of colonisation is in chronologies of various occasions that shaped the whole colonial system. This started with the Dutch settlers, when Jan van Riebeeck arrived at the Cape colony whilst travelling to India in 1652, to setup a refreshment station for the trading. He made contact with the Khoi and San people whom he traded and bartered fresh meat with. During the expansion of the Table Bay, due to the need for land, the Khoi were forced to retreat in a northerly direction, allowing the settlers enough land for agriculture and pasturing for livestock (SAHO 2015b: 1). After a hundred years of living in the Cape, a number of Voortrekkers started travelling to the north to establish farms whilst others were looking at ways of leading a nomadic lifestyle (Frye et al 2011: 239). This was dubbed the Great Trek.

The travelling up north led to interactions with blacks in Natal whom they fought with and dispossessed their land; some people were then taken as labourers. The British had to intervene after several years of such barbaric actions to the Zulus and Bantus. In 1843, the Boers left the colony and continued with their trek to the north after the British won and settled in Natal. The British survived in the Natal Colony through taxes charged to blacks and the sugar plantations. As the demand for sugar grew, and the labourers were no longer enough, the British decided to source slave labourers, in the

form of indentured labourers, from India in 1860 (SAHO 2015c: 1). This is why South Africa today has Indians as part of its residents. The trekkers settled in the Orange Free State and Transvaal (Gauteng).

The Great Trek was followed by the Anglo Boer war where the Boers and British fought over the land, the Transvaal, as well as mineral resources. The war lasted for three months, beginning at the end of 1880 until March 1881. In the first war that took place in December, the British were outnumbered by the Boers (SAHO 2015d: 1). The British were further defeated in Majuba where they lost most of their armies as compared to the Boers who only lost two men. Transvaal, Pretoria, was then given independence by the British after their defeat in 1881. There was some peace although the Boers were not in agreement with the British conditions on how they maintained some control over the Transvaal. Failure to full autonomy of the Transvaal by the Boers and other political tensions led to a second Anglo Boer war that broke out in 1899. It is argued that the war was also as a result of Britain's resistance to what was going to be an economic independent South African state which would overthrow its powers (Giliomee & Mbenga 2007: 210).

The war took a toll on the Boers as they lost their farms, and their women and children were captured and put in concentration camps (Giliomee & Mbenga 2007: 216). Moreover, the blacks were becoming hostile to them, and they lost 5 464 of their soldiers and commandoes to the British who fought against them. In 1902 both the Boers and the British agreed to end the war that was costing both. It was agreed that the power would be shared and Boers would get full voting powers. The limited voting powers for blacks, which was proposed by Chamberlain, was curtailed by Smuts (Giliomee & Mbenga 2007: 216). The second Anglo Boer was also influenced by the minerals that were discovered in the Transvaal. There were disagreements over who should lead the Transvaal, as well as acceptance of foreigners such as the Uitlanders to get citizenship in South Africa (SAHO 2015d: 1).

In 1948, the system of apartheid was formally accepted as law in South Africa. Separation and inequality had been a feature of South Africa since the beginning of the colonial days. Apartheid created political exclusion but also economic exploitation of the black South Africans (DBSA 2005: 26). According to Giliomee and Mbenga

(2007: 315), it restricted power to whites only, introduced racial classification and racial sex laws and segregation of educational and public facilities, and protection for whites in labour market. Moreover, apartheid enforced pass laws for blacks as a way to control influx to the cities. The Group Areas Act number 1 of 1950 introduced racial segregations where South African ethnic groups were forced to live separately (O'Malley 2015: 1). Homelands were created as a basis for preventing them from demanding rights (Frye et al 2011: 246). Hunter (2011: 1110) argues that the homeland system was a means to promote ethnic identification in order to divide black South Africans. The homelands were used to separate the different ethnic groups, namely; Ndebeles, Pedis, Sothos, Swazis, Tsongas, Tswanas, Vendas, Xhosas, and Zulus.

Homelands were governed by traditional authorities, namely, kings and chiefs. The baPedi people and northern Ndebeles lived in Lebowa, now Limpopo province under the leadership of Nelson Ramodike. The baSotho lived in Qwaqwa in the Free State under the leadership of Tsiamé Mopeli. The south Ndebele lived in Kwa Ndebele that is in Mpumalanga and were led by Simon Skosana. The Swazi people stayed in Ka Ngwane, also in Mpumalanga and led by Enos Mabuza. The Tsonga people settled further north of Limpopo province in Gazankulu led by Hudson Ntsananwisi. Limpopo province was also a home to the Vhavenda people led by Patrick Mphephu. The homeland of Bophuthatswana was under the leadership of Lucas Manyane Mangope, and he led the baTswana nation. BaTswana settled in the North West province. Xhosa people were moved to Ciskei and Transkei, now known as Eastern Cape governed by Chief Kaizer Matanzima. Ciskei was led by Lennox Sebe. The Zulus lived in KwaZulu-Natal, governed by Chief Gatsha Buthelezi.

The mineral resources, both a source of wealth and a source of conflict, were discovered in the Transvaal (Gauteng). The diamonds were discovered in 1867 whereas gold was discovered in 1886 (SAHO 2015a: 1, Williams 2006: 1). This led to industrialisation where the mined resources were sold abroad. The mining activities required more labour, of which black South Africans did the job. Townships were constructed to house labour separately from white areas. The mine workers were at first living in compounds that later caused diseases due to overcrowding. The ruling government then decided to build four-roomed houses for miners who were married

and hostels for the unmarried (Hunter 2011: 1111). The proceeds from the mines were used to fund the infrastructure in the provinces where the colonisers lived.

For many years, millions of people in South Africa worked in the gold mines and commercial agriculture, but they still did not escape poverty. This was because they were unskilled and could not get a minimum wage, and because of the apartheid system there was restricted mobility in terms of changing jobs (Chen & Jhabvala 2001: 15). A period between the nineteen seventies and the early nineties saw the struggles against the apartheid government coupled with international sanctions on the economy (Hunter 2011: 6). This led to the collapse of apartheid wherein the majority in South Africa elected the new government in 1994. This marked the first time in the history of South Africa when blacks could cast their vote for a democratic country (Moller 2007: 184).

4.2.2 The impact of colonisation in South Africa

Colonisation resulted in residents of South Africa losing ownership of their properties and belongings as well as their freedom. In the process of colonisation, land was dispossessed from black South Africans. They were moved around the country and placed in areas where the existing natural resources were inadequate to sustain them. During this process of racial classification, it is said that people were not given an opportunity to take all their belongings, only meagre ones could be taken (Reed 2006: 125). Moreover, the removals were brutal and families were split along racial lines, with no compensation for losses incurred. This has left a legacy of unequal rural and urban settlements as well as racial discrimination (Papier 2013: 3)

Colonisation brought with it the loss of the culture of the Africans as was evident in the Khoi and San people, who also lost their land to Europeans as they did not have title deeds of their land (Mitchell 2015). Other Bantu tribes also lost their land to the Europeans as they travelled deeper into different parts of the country in search for farming and grazing land for their livestock as well other opportunities. Black people were exploited by the mining industry and in working on colonisers' farms. They were separated from each other, thus engraving a culture of inferiority amongst the existing ethnic groups. New ways of living, such as European religious practices, were

introduced to blacks, which led to some black people losing their cultural norms (Giliomee & Mbenga 2007: 56, 57).

The impact of colonisation is further evident in the education system. Black people were given poor education, which was mainly to train them to do menial jobs. Thus, depriving them of opportunities to have access to other skills. To date, this is still causing problems in the democratic government. It is reported that South Africa has a high number of scarce skills such as engineers, to an extent that when such resources are required they need to be outsourced from other countries (Clark 2013: 1).

Long-term suffering of the colonial oppression has left a number of leaders in government in a position to want to be paid for their struggle. The government is currently synonymous with corruption and the self-serving mentality of the office-bearers. According to Moller (2007: 190), parliamentarians continue to retain their seats in order to maintain lavish lifestyles. Whilst politicians are receiving exorbitant salaries, other public servants such as teachers are underpaid and resort to strikes, leaving learners alone in their classrooms (Alam & Farid 2011: 300). Teachers are not only faced with salary challenges, but infrastructural challenges as well. Some schools do not have decent classrooms, electricity, water and sanitation (DRDLR 2011: 37). Issues of overcrowding are also a major challenge for some South African schools (Spren & Vally 2010: 40).

4.2.3 Post-apartheid South Africa

The new democratic South Africa was born in 1994 under the leadership of Nelson Mandela. This led to blacks, whites, coloureds and Indians co-existing in the new democracy. The country does not only have the cultural diversity, but it also have a constitution which embraces all the languages, enabling it to have eleven official languages (de Klerk 2006: 214). The official languages includes Afrikaans, English, Ndebele, Pedi, Sotho, Swazi, Tsonga, Tswana, Venda, Xhosa and Zulu (Pereltsvaig 2012: 122). The new government inherited scars and injustices of the preceding regime. As a result, the country is faced with the legacy of group realities characterised by experiences based on day to day life in a highly unequal socioeconomic and spatially divided society (Burton 2002: 52, Chisa & Hoskins 2013: 236). The society is

characterised by poor living conditions such as shack dwelling and limited access to basic services.

The economy is also functioning in such a way that still reflects the past injustices in terms of distribution of wealth and resources. For instance, some communities still lack access to basic services such as water and decent houses. The structural challenges are still rife, with poverty, unemployment and lack of basic infrastructure affecting most black communities. This is coupled with the high number of the people affected with HIV/AIDS. According to Statistics South Africa (2014b: 3), an estimated 10.2 per cent (5,51 million) of the population is living with HIV/AIDS. The promised “better life for all” by the new government has failed to deliver services to redress the socio-economic gaps (Moller 2007: 187-188). The Accelerated Shared Growth Initiative of South Africa (ASGISA) was launched in 2005 as a vehicle to support the developmental goals of reducing poverty and unemployment (South Africa 2008: 5). However, it failed to reach the set minimum six per cent economic growth from 2010 going forward (UN 2010a: 112). The National Development Plan (NDP) still aims at an average of five per cent annual increase for the economy to respond to the social needs (NPC 2011: 28). However, the economic growth is still at a slothful 4.1 per cent (STATSSA 2014a: 2), failing to surpass the five per cent of the NDP.

The highly economic stresses experienced by the people in South Africa are reflected in recurring protests, violence and unrest within communities. Such social outbursts are directly linked to socio-economic issues. According to the United Nations (2011: 49), poverty and unemployment leads to social unrest, manifestations of deviance, frustrations which may result in domestic violence, and street protests which inevitably threatens social cohesion. Some of the South Africans are now dependent on social security grants to deal with the burden of unemployment and poverty. Statistics shows that about 16,3 million of the population depend on social grants (Ferreira 2015: 1). Employment is the only option to help those who are in need of social security.

Efforts to support business activities to spur employment opportunities are also not helping the struggling economy. This is evident in initiatives such as the broad-based economic empowerment which has only benefited a minuscule number of affluent blacks, leaving those who were historically poor in a similar state (Moller 2007: 190).

In addition, this has perpetuated three classes amongst blacks: elite; middle class and poor. Giliomee and Mbenga (2007: 426) has also noted that the gap between the black and white middle class is still wider, as only a fraction of the blacks have moved to that classification of having an income of R120 000 per year. In his paper, Ndletyana (2014: 4) argues that the middle class is a direct cause and effect of the economy. This means if the economy grows, the class increases, and if it slows the class drops as well. According to Ndletyana (2014: 5), only 17 per cent of the population can be classified as middle class; and of this 17 per cent is 51, 34, and six per cent of the blacks, whites, coloureds, and Indians respectively who are middle class. With the overall percentage of the middle class and its race categorisation, it is evident that the country has not made significant progress in terms of addressing inequalities.

Socio-economic policies such as Reconstruction and Development Programme (RDP) were put in place to rebuild an equal society (ANC 1994: 4, SAHO 2015e: 1). Although the promise was made to the first black voters that they would receive free houses, electricity and water was somewhat met, whereby a million houses were built by the year 2000 (Moller 2007: 186). The RDP failed to continue to deliver some of these services to the communities who needed them. Its succeeding policy, Growth Employment and Redistribution (GEAR), was launched in 1996 to accelerate and stimulate economic growth thereby, amongst other things, reducing the fiscal deficit (South Africa 1996a: 3). The aforementioned saw RDP as counter progressive because the expenses incurred were said to be delaying the country from competing globally (Frye et al 2011: 282, Moller 2007: 186). As a result, some people continue to live in houses of inferior standard (such as small houses and shacks) whilst the influx to the cities also led to more informal settlements without basic services.

This democratic government carries with it various social challenges, which include safety and security. The country is encountering the one of the highest crime rates in the world, which impacts negatively in the lives of people. The crime rate is believed to be linked to the issue of unemployment that leads those who cannot be absorbed by the labour force to make a living out of criminal activities. Petty crimes such as theft of personal belongings is a major source of crime, as media devices such as mobile phones and televisions are easy to dispose to those who cannot afford to buy new ones.

4.3 STATE OF SOUTH AFRICA'S DEVELOPMENT

South Africa is regarded as a developing country as it is one of the countries in Southern Africa that has not been fully developed. However, it is regarded by others as a developed country as its infrastructural and economic status is better compared to those of other African countries (Nielsen 2011: 13). The developed status was also used to classify the countries between the 1980s and 1990s by the apartheid regime (Ismail & Vickers 2013: 107). It has varying economies, and the nature of the economy in some urban or rural communities allows it to be regarded as a developing country.

The challenges experienced by the developing countries are recorded by Croal and Wes (2002: 83, 84) to be those of quality of life of the rural compared to urban areas on issues of health, education, development of women in society, infrastructure, good governance, poverty reduction and the environment. The poor quality of life in South Africa is revealed through the increasing service delivery protests by the rural and less developed urban communities. For instance, issues of access to water are common in the rural communities (Reed 2006: 15, 122). The fight over economic opportunities has also given rise to what is termed xenophobic attacks, where African foreign nationals are being killed and their businesses being looted as part of a social outcry for livelihood resources.

The challenges and injustices endured by the oppressed South Africans assisted in awarding the country respect in terms of dealing with the oppression. The peaceful approach exercised by the leadership of the late former President of the Republic of South Africa, Dr Nelson Rolihlahla Mandela became key in many international discussions, particularly on conflict (Ismail & Vickers 2013: 10). Some of the steps taken towards redress included participating in international discussions on development (Ismail & Vickers 2013: 105). South Africa became an icon of peace and President Mandela and the Truth and Reconciliation Commission discouraged reconciliation despite the pain endured by its citizens, as conflict was not an option for it to attain democracy and retaliation after the fall of apartheid.

The Post- Apartheid government put ICTs in the centre of their development efforts in reshaping the socio-economic conditions. It is argued that ICTs have been part of the

agenda before the African National Congress (ANC) government could be voted into power. Moodley (2005: 4) points out that the decision to include ICTs in the development agenda was equal to the rapid development programme manifesto of the ANC. This is evident in the government's decision to support the development of ICTs in areas of education, health and small, medium and micro enterprises (South Africa 2004: 10). Infrastructure development in some parts, particularly the cities, of the country continues to encompass those of ICTs.

4.3.1 The economy of South Africa

South Africa consists of different economies, namely the first economy that is developed and second economy which is underdeveloped (ANC 2005: 1). These are the affluent and the poor. The affluent are in the suburban and some urban parts whilst the poor are in the urban, semi-urban and the rural communities. These two different economies of the affluent and the poor were created by apartheid and colonisation. The first economy still continues to benefit from second economy as it is the one that helps it to flourish in terms of providing labour (Frye et al 2011: 248). This was partly instilled by the apartheid regime which did not only oppress the black South Africans but instigated homelands which placed blacks in areas that did not have adequate infrastructure (Giliomee & Mbenga 2007: 319). In this dispersion, the remote areas were therefore trapped in poverty whereby they had to go to the first world for employment opportunities (DBSA 2005: 12). Those who migrated to cities ended up settling permanently in areas closer to the bigger cities, the urban areas. This contributed to the high number of people migrating into the cities.

The migration to urban areas started during the apartheid regime when black African would search for employment. The then government ended up constructing townships for the workers. According to Harrison (2002: 173), the cost of these townships were funded by the beer halls and restaurants which were built in those communities. The money generated from these outlets paid for the infrastructural costs incurred when developing those areas. To date, employment and economic opportunities continue to be accessed by migrating to the cities. The ones working in the cities sent money back home, which meant the second economy depended on the trickle down effects (DBSA 2005: 12) of the first economy. The second economy is as a result of people migrating to urban areas in search of better living conditions and employment opportunities

(Pade et al 2005: 8). Thus, failure to secure employment resulted in these people continuing to live in poverty in urban and rural communities.

The urban influx still dominates the lives of the rural residents, as good employment opportunities are still rooted in big cities, with males being a majority of those migrating to the cities (Shange 2014: 118) whilst women remain in rural areas to take care of the family. In pursuit of escaping poverty, the second economy is also dependent on social grants paid to the elderly, children and those with disabilities (ANC 2005: 1, Swanepoel & De Beer 2011: 8). According to Kumar (2009: 26), the provision of social grants has increased from three to 12,5 million between 1997 and 2008. The increase in social grants is one of the government's strategies to address poverty. However, the increased dependence on social grants reflects how the economy continues to fail in actively supporting its citizens. Measures to increase employment are substituted with social grants, which means people have limited opportunities for self-sufficiency (Jiyane et al 2013: 2). Frye et al (2011: 258) state that failure to actively participate in the economy is as a result of deep inequalities entrenched in the South African society. Inequalities translate into lack of resources for people to participate in the economy and become self-sufficient, hence the poor growth of the economy.

4.3.2 Infrastructure

The output of money made from the mineral resources were used to build infrastructure around the cities such as Pretoria, Durban and Cape Town. However, these infrastructural developments were only targeted in areas where the whites and Boers lived. This meant that the post-apartheid South Africa had a duty to undo this imbalance by developing areas that were formerly left out. However, development into such areas that are mostly rural has not been impressive. Some areas still lack basic infrastructure such as schools, water, sanitation, decent shelter, roads and transport (OECD 2013: 65). As communities continue to grow and old school buildings dilapidate, learners find themselves with no classrooms. They therefore have to attend in corrugated iron (shacks) classrooms or under the trees. The situation affects both the rural and urban parts of the country.

Shacks are also a popular dwelling type for black communities who live in squatter camps (mushrooming communities outside established rural, suburbs and urban

areas). This is because shacks are cheaper to build as compared to normal brick and mortar houses. Such communities are faced with challenges in accessing water, electricity and proper roads. The government normally take long to respond to the needs of such new communities and they spent many years before being provided with required infrastructure, that is, if they are residing in areas certified for residential dwelling. The illegal squatter camps are also a reflection of the government's failure to plan accordingly for its community growth, thus resulting in people positioning themselves anywhere they think it would be suitable for living.

Established rural communities are also not immune to issues of access to water (Reed 2006: 122). They have to depend on buying water from neighbours who have drilled boreholes for accessing water. Some buy it from those who sell water in tractors. Some municipalities have introduced piped water in their communities, but these taps do not always provide communities with water. Some squatter camps are fortunate to have water delivered by the municipalities in trucks and several times per week. In these instances, community members must fill up their water drums and bottles with water. A similar strategy is employed by the piped communities, who can have street taps providing waters only on certain days. This shows the survival strategies that South African communities use in order to cope with the basic needs challenges. In a continued mission to survive despite challenges, communities that do not have flushing sanitation use pit latrines. Almost all rural communities have used pit latrines even during the apartheid regime. They still continue to use them today, even in schools (UN 2011: 51). This is despite unfortunate accidents that continue to take place in schools where learners die due to falling into pit latrines (Hawker 2014: 1).

With the basic infrastructure being a challenge, access to modern infrastructure such as telecommunications and broadband may be a dream for such communities. The United Nations (UN 2013: 15) proclaims that everyone should have access to drinking water, roads, transport and ICTs. However, that is not a reality in most developing countries, particularly here in South Africa. More still needs to be done for this country to address the social inequalities and ensuring that its majority can have access to basic infrastructure.

4.4 CASE STUDY OVERVIEW

Communities are located in a geographic area which determines the kind of lives lived and activities undertaken. Communities are heterogeneous based on the inhabitants, resources found and the culture formed in them. The community of Phake Rebone is not unfamiliar with the issues of poverty borne by the low levels of development. The community continues to face unemployment and underemployment, including unsatisfactory service delivery from government at municipal and provincial level (GTZ 2008: 4). The reasons behind this are cited as a lack of integration of development planning and cooperation from the private and public sector, which leads to poor coordination of development programmes (GTZ 2008: 5). With these noted challenges, the following subsections provide a description of the Phake Rebone community.

4.4.1 Nature of selection

The case study chosen by the researcher plays an important role towards achieving the objectives of the study. Points to keep in consideration include selecting a case that will provide the maximum amount of the researched phenomenon (Bleijenbergh 2010: 2). The researched phenomenon is quite broad and thus requires the researcher to have a heterogeneous sample. This assists in capturing different aspects of the researched phenomena. The main objective of the research, as stated in chapter one, section 1.4, is to understand the impact of mobile phones in rural communities with regard to development and how the impact can be measured. In order to achieve this objective, a rural community was chosen as a representative group to investigate the researched phenomenon. As noted in the literature review chapter regarding the widespread use of mobile phones, different participants in a community were selected with the aim of understanding the impact among different groups of the Phake Rebone area. This area suffers from social inequalities, including unemployment and underemployment, and it is important to evaluate how the mobile phones are used for development related purposes.

4.4.2 Case study description

Phake Rebone is situated in Mpumalanga, alongside the border of Limpopo. Although belonging to Mpumalanga, the nearest city is Pretoria in Gauteng. Most residents commute to Pretoria on a daily basis for employment. As stated in chapter five (section 5.3.1), the distance travelled between Phake Rebone and Pretoria is close to 90 kilometres. This village, like many rural areas, was part of a former homeland (see section 4.2.1, paragraph five) (GTZ 2008: 4). It was under Moretele Two, part of the Bophuthatswana homeland. Phake Rebone is a new area that was only occupied in 2008. The community was relocated from Greenside near Marapyane after they experienced floods in 2006. The community was then advised to move from Greenside, as the area was now declared unsafe for residence. They were moved to a section called Klippan in Marapyane whilst waiting for government to find suitable land for them. The suggestion to move, however, was not favoured by all community members. The decision to move was from the government, which meant that the community had to choose to be under the jurisdiction of the municipalities and be led by councillors. Those choosing to remain would continue to be governed by the Queen of Marapyane. Those fearing for their lives decided to move to avoid future floods whilst others remained with fear of losing their properties (houses and boreholes).

The separation between the two groups was never easy for the community that lived together for so long, and others had to part with their relatives with the hope that government would rebuild their houses and provide them with all basic services. Their arrival in Klippan was unwelcomed by some of the community members of Marapyane who felt that the new community was stealing their land. There were often threats which would have ended in violence had the police, government officials and the Queen not intervened. The community built shacks to start up their new lives whilst waiting for the government to move them to a permanent place. Trucks delivered water until tap water was placed in each street corner for the community to fetch it there. School children attended the schools nearby whilst others travelled at least two kilometres on foot for the middle school.

The community lived in Klippan for a year and a half, and they were then relocated to Phake, between Phake Thabeng and Phake Ratlhagana. They then named their area Phake Rebone; the name honours the challenges that they had gone through in their

previous locations. This community faced rivalry over land despite the approval of relevant authorities to occupy the land. Their arrival in Phake was almost similar with the Klippan one where some community members were against them occupying the open land. It was, however, better compared to the Marapyane residents, as there were no confrontations. Community members rebuilt their shacks and waited for the government to build them the promised houses. Water was fetched in the nearest public water pumps. The four-roomed houses (known as RDPs) were built three years later. Piped water was also provided few years later.

The community continues to grow, and currently has a new section which is mostly occupied by younger people who are starting their own lives. The area is called Rebone Extension. The extension area does not only accommodate Phake Rebone descendants, but also people from other villages within and outside Phake. Phake Rebone is the 30th ward of Dr J.S. Moroka Municipality⁷. The municipality has a population of 249 705 as recorded by the 2011 census statistics (STATSSA 2012d: 10). It is the second municipality with a slow population growth in the Nkangala District, see Figure 4.1. The municipality also has a large number of active people, who are able to be in the work force. The people aged between 15 and 65 make up 59.5 per cent of the population group. Only 6.5 per cent belong to the pensioners group and 32.6 per cent are younger than 15 years.

⁷ More information on Dr J.S. Moroka Municipality can found on this link: http://www.moroka.gov.za/ward_councillors.html

	Population		Age Structure						Dependency Ratio		Sex Ratio		Population Growth (% p.a.)	
			<15		15-64		65+		Per 100 (15-64)		Males per 100 females		1996-2001	2001-2011
	2001	2011	2001	2011	2001	2011	2001	2011	2001	2011	2001	2011	1996-2001	2001-2011
MP304: Pixley Ka Seme	80 737	83 235	38,6	34,9	56,3	59,4	5,1	5,7	77,7	68,3	87,5	90,4	2,80	0,30
MP305: Lekwa	103 265	115 662	32,1	28,6	63,6	66,4	4,3	5,0	57,2	50,6	96,2	99,4	2,73	1,13
MP306: Dipaleseng	38 618	42 390	32,9	28,2	61,8	66,0	5,3	5,8	61,8	51,6	92,9	102,6	-0,22	0,93
MP307: Govan Mbeki	221 747	294 538	29,0	26,9	68,1	69,4	2,9	3,7	46,9	44,0	102,6	106,9	1,12	2,84
DC31: Nkangala	1 018 422	1 308 129	33,4	28,5	62,2	66,5	4,4	5,0	60,7	50,4	92,8	100,7	1,13	2,50
MP311: Victor Khanye	56 335	75 452	31,9	28,2	63,9	67,1	4,2	4,7	56,6	49,1	97,0	106,0	1,14	2,92
MP312: Emalahleni	276 413	395 466	28,4	25,2	68,8	71,2	2,9	3,6	45,4	40,4	103,7	111,8	3,16	3,58
MP313: Steve Tshwete	142 772	229 831	29,6	25,0	67,0	70,7	3,3	4,3	49,2	41,5	97,8	108,1	1,07	4,76
MP314: Emakhazeni	43 007	47 216	31,5	28,0	63,5	66,2	5,0	5,8	57,5	51,0	96,6	104,2	3,01	0,93
MP315: Thembisile	256 583	310 458	37,2	32,1	58,2	62,9	4,6	4,9	71,7	58,9	86,1	90,7	1,22	1,91
MP316: Dr JS Moroka	243 313	249 705	37,9	32,6	55,6	59,5	6,5	7,9	79,8	68,2	84,2	88,9	-1,27	0,26
DC32: Ehlanzeni	1 447 125	1 688 615	37,9	33,1	57,7	62,4	4,3	4,6	73,2	60,4	88,6	90,8	1,18	1,54
MP321: Thaba Chweu	81 681	98 387	28,4	25,2	67,2	69,9	4,4	4,9	48,9	43,0	99,4	105,1	4,29	1,86
MP322: Mbombela	476 903	588 794	34,6	29,8	61,5	66,0	4,0	4,2	62,6	51,6	91,3	94,3	2,25	2,11
MP323: Umjindi	53 744	69 577	27,3	27,6	69,0	68,2	3,7	4,2	44,8	46,6	111,7	109,8	2,03	2,58

Figure 4.1: Demographics of Nkangala district population

Source: (STATSSA 2012d: 10)

4.4.2.1 Socio-economic landscape

The lifestyle in Phake Rebone is made up of the employed, unemployed, pensioners and school-going children. Employment can be secured by looking for jobs outside the village, in the nearest surrounding areas, where the cost of daily traveling is affordable or where relocation would be affordable. Other forms of employment are SMMEs within the community. These are, however, self-employment rather than employing other community members.

Employment opportunities, besides business opportunities in the community, nearer to the area are the tourist attractions of Dinokeng Game Reserve in Hammanskraal, North West. The area is in the border of Limpopo and Gauteng, 35 kilometres away from Phake Rebone. It has more than five game lodges that offer day and night game drives, guided bush walks, bass fishing and game viewing⁸. The small town of Hammanskraal, has Babelegi industrial firms, public and private institutions that employ some members of the Phake area and its surrounding villages. According to STATSSA (2012d: 23), the education and economic activities of Dr J.S. Moroka Municipality has improved considerably between the year 2001 and 2011. The number

⁸ More information about the game reserves can be found on:

<http://www.dinokengreserve.co.za/Home.aspx>

of members who were not attending school was reduced from 33.5 to 17.4 per cent. Higher education and matric results have also increased from 5.1 and 17.1 per cent to 6.6 and 25.1 per cent, respectively. Nonetheless, the province is rated second on having more people over the age of 20 without any formal education (STATSSA 2012e: 21). This means that unemployment may continue to affect the province due to its low percentage of formal education.

The decrease in unemployment may be linked to the performance in the education sector because education affords people the opportunity to compete in the job sector. The unemployment rate was 46.6 per cent in 2011 compared to the 60.7 per cent recorded in 2001 (STATSSA 2012d: 23). However, the recent unemployment statistics still need to be addressed so that they can be reduced. The youth statistics of unemployment are at an alarming 61.4 per cent. The report of STATSSA (2012d: 45) further shows that this municipality does not have many functioning household services such as piped water, sanitation, refuse removal and telecommunication. The area does, however, have electricity with ratings of 97.6 per cent compared to other services that stand at less than 15 per cent. This is a true reflection of the current status of the Phake Rebone area. The only difference is that in this ward, services such as piped water, refuse removal and sanitation are almost non-existent. When examining Figure 4.2, it can be concluded that in the Nkangala District, only four municipalities have all the household services as compared to the researched municipality and the Thembisile Municipality.

	Household services									
	Flush toilet connected to sewerage %		Weekly refuse removal %		Piped water inside dwelling %		Electricity for lighting %			
	2001	2011	2001	2011	2001	2011	2001	2011	2001	2011
DC31: Nkangala	43,8	48,7	41,8	48,3	23,8	40,6	79,3	85,7		
MP311: Victor Khanye	63,2	70,6	62,3	73,7	28,4	48,4	65,0	84,9		
MP312: Emalahleni	71,6	68,8	64,2	67,2	41,9	54,9	70,3	73,4		
MP313: Steve Tshwete	75,7	81,9	82,6	84,7	36,3	62,2	74,8	90,8		
MP314: Emakhazeni	65,5	74,4	56,9	71,7	36,9	55,0	70,4	83,6		
MP315: Thembisile	5,5	6,8	3,8	4,6	5,0	16,3	88,6	92,3		
MP316: Dr JS Moroka	11,6	13,3	12,3	13,6	4,0	14,2	91,8	96,7		
DC32: Ehlanzeni	19,1	21,5	20,5	24,7	13,7	26,4	68,3	88,9		
MP321: Thaba Chweu	57,4	64,2	58,1	58,6	30,0	38,8	75,3	84,3		
MP322: Mbombela	23,1	28,4	25,0	29,4	20,0	37,1	71,4	90,2		
MP323: Umjindi	54,5	59,6	65,8	65,3	31,1	42,0	57,5	78,5		
MP324: Nkomazi	9,3	7,7	11,0	20,3	6,5	21,0	47,6	83,3		
MP325: Bushbuckridge	7,1	6,8	6,4	7,5	5,2	11,9	79,0	93,9		

Figure 4.2: Municipal services of the Nkangala District

Source: (STATSSA 2012d)

Agriculture is another source of survival. Subsistence farming is practised seasonally, and maize is the crop that is most planted. Small farming initiatives are emerging, although the participants are mostly elders. Through the Mpumalanga Department of Agriculture, interested members of the community have been offered extended land that they can use for farming purposes. Since the land is still governed as a tribal property, community members cannot be given private land or plots. These elders have started cooperatives for vegetable gardens that are used to feed the community and the Refithile Primary School. According to Moeletsi's (2010: 10) report, the vegetable project has assisted in reducing poverty in the community. The garden harvests are sold to the Phake area and surrounding communities. The project also donates some of their produce to poor households. The poor participation of youth in these farming activities could be the result of no exposure to commercial or subsistence farming activities in these former homelands (Meyer 2000: 140). The government's failure to give people full ownership of the land may be another discouraging factor.

4.4.2.2 Ethnicity

The community of Phake comprises mostly the Bakgatla clan who belong to the Batswana tribe. This is, however, not the case with the Phake Rebone community. The community has a mixture of "baTswana", "baPedi" and "ma⁹Tsonga". The spoken language is mainly SeTswana owing to the influence of the neighbouring villages. The culture of speaking SeTswana traces back to the days prior to the community relocating to this area. The community lived in Greenside, which was closer to Marapyane. The community was therefore under the leadership of the Bakgatla Queen, which is where the language adoption really took place. The entire area of Phake is dominated by the Bakgatla clan, which makes SeTswana the dominant spoken language. SeTswana is also taught as a home language in schools, hence the prevalence of SeTswana in this area. The intermarriages between the different ethnic groups have also contributed in strengthening the dominant language. The community

⁹ This is similar to the explanation in number three above. The phonetic combination requires that "ma" be used instead of "ba".

has those who follow Christianity and ancestral traditional norms. However, Christianity dominates.

4.4.2.3 Culture

The community of Phake Rebone, although with different ethnic groups, has developed a culture of taking care of each other. According to Meyer (2000: 198), rural communities have a sense of helping each other, which enforces the collectiveness. The collectiveness in the community is mirrored by the Community Policing Forum (CPF) activities that enable it to resolve issues in the community. Their collectiveness is also highlighted during the passing on of other community members. In this case, both men and women will provide support to families of the deceased by visiting them during the mourning week.

Men and young men play a huge role here; they participate in digging a grave for the deceased and collecting wood to assist the mourning family of the deceased. This group is called “Diphiri” which can be translated to “Hyenas” in English. The cemetery is also well respected and women and men are required to dress in a certain way to show respect. The congregation is also expected to arrive at the cemetery at seven o’clock in the morning. Women wear dresses or skirts and cover their shoulders and heads. Men wear a jacket. The congregation is not allowed to talk in the cemetery, and mobile phones must be kept off or on silent mode. Failure to adhere to the rules and misbehaviour may lead to the families of the deceased or the mortuary being fined. The amount charged is R200 (two hundred rand). The fine is also used to ensure that all members in the community adhere to their required duties such as that of the Diphiri.

4.4.2.4 Political landscape

Governance is made up of the political parties, municipality and tribal authorities from the chieftaincy. In the past, this area was under traditional leaderships led by chiefs. However, that changed when the government of Bophuthatswana ceased to exist under the new democratic government in 1994¹⁰. As a result, the community is

¹⁰ More information about Boputhatswana government can be accessed here: <http://www.sahistory.org.za/places/bophuthatswana>: accessed 25/09/2014

currently being led by a political party, in which the ruling party is the one in power. The community is under the leadership of a village councillor who reports to the municipal head offices in Siyabuswa, about 75 kilometres away from Phake Rebone. The majority of the people in this area are ANC supporters; recently, other political parties are also gaining support.

Dissatisfaction with the governing party at a municipal level has pushed some members to opposition parties. The slow development of the area in general is blamed on poor performance of the councillors and corruption. For instance, the community was supposed to be provided with sanitation. However, they were built in only a few households and they were not fully functional. The rest of the community has been waiting for this project to be completed, but that still has not happened, and it has been over ten years now. Lack of basic services is therefore linked to political failures of its leadership. The traditional leadership has not been fully dissolved and they are used to guide on tribal and cultural matters. Phake as a village does not have a chief, so its tribal lineage is with the community of Pankop. The community leadership therefore recognises and involves the tribal authorities in various matters of the community. The community's political inclination is another way of getting community members to meet often to discuss political and general issues. The same platforms as requested by political bodies are also used to hold social events and celebrate some holidays that are marked important by their political representatives.

4.4.3 Participants

The sampling of this study addresses the key role players in this community (refer to section 3.3.1 of Chapter Three). Involving learners, educators, CPFs, health workers, businesses, community leadership and community members allowed the researcher to collect information on the different uses of mobile phones. These seven different groups have different ways of interacting with mobile phones. The subsections below provide an overview of the groups. The community group sums up the community members, business, CPF, community leadership and the health group. The education group is discussed separately in the next subsection.

4.4.3.1 The community

The community of Phake Rebone engages in various activities to keep busy. As stated in section 4.4.2.1, they are either working in or outside the village. Other activities in the village include small businesses in the form of tuck shops and taverns. Other members keep busy by being involved in resolving issues such as crime and other issues such as violence in families and in the community. This team involved in these activities is the CPF (refer to Chapter Five, section 5.3.1). The CPF holds the community together and ensure that there is peace. They work closely with police department in Mmamethake in cases of crime and violence. Another group is of community leaders that is responsible for providing leadership in the community. They are members of the leading political parties who work closely with the councillor and the municipality. They are involved with political matters, community projects and engage tribal authorities on cultural and spiritual matters. The Phake Clinic caters for the health needs of this community, which is in community of Phaphamang. The workers in this clinic are from the nearest communities and the Hammanskraal area. They offer basic health care services to the community.

4.4.3.2 The education role players

The learners start school doing Grade R at the age of five or six years as prescribed by the Department of Basic Education (DBE) (DBE 2003). The primary school caters for Grades R to Grade six. The next phase is then the middle school, which caters for Grades seven to nine. The last phase is the high school that is for Grades 10 to 12. The after school period is mainly spent on doing household chores and playing with friends in the street. However, the activities may be different for the secondary group, and it will be interesting to see what the results of the study will shed.

The educators in this community are only for the primary school phase. The middle and high schools are outside the community of Phake Rebone. The majority of the educators are not from the studied community. They are from the surrounding areas, including Hammanskraal and Pretoria.

4.5 CONCLUSION

This chapter briefly painted the historical landscape of South Africa, discussing how colonisation started and the effects of white supremacy. Dispossession of land and livestock did not only affect the Khoisans, but also the “Bantus” who had to suffer the oppression of whites and continue to be exploited in extracting minerals that only enriched whites. The land itself witnessed wars of power over who should govern South Africa between the British and the Boers. This left South Africa being a divided country where blacks lacked freedom of movement. Ethnic divisions were sown by introducing the homeland systems where blacks could get only a small portion of land under tribal authorities. The emergence of a free South Africa was therefore filled with racial, ethnic, class issues in terms of resources and infrastructure. Poor development of some urban and rural communities meant a need for rapid development, which has not taken place. The researched community is one of the rural communities that lacked development, and they are still struggling with access to some basic services.

The chapter further discussed the target group, dissecting it into the nature of the selection, the description of the target community and the participants involved. The nature of the selection shed light on how the decision to use different groups within a community assisted in understanding the usage of mobile phones. It was found that the area belonged to one of the growing municipalities in Mpumalanga, Nkangala District, called Dr J.S. Moroka. The municipality is ranked at number three out of the six municipalities in this district. Most of the community members commute to the nearest provinces for employment, with the greatest distance travelled being 90 kilometres per single trip by busses. Basic services such as piped water and sanitation are still a major challenge for them. However, the area has electricity.

The common language spoken is Setswana and it is also taught in schools. The area comprises the “maTsongas”, “baPedi” and “baTswana”. The community has a strong sense of collectiveness, and this is expressed through the CPFs’ work and social gatherings, be they cheerful or sad ones. They also have rules that govern activities such as burials. The collectiveness of the community is strengthened by death-related activities, whereby members who fail to provide the needed support are fined. The last section of the overview chapter laid out the different players in the community that

have been chosen for the study. The key seven groups were discussed, and only the results of the researched groups can detail the level, if any, of the uses and expectancies of mobile phones. The next chapter provides the actual study results.

CHAPTER FIVE

5. RESEARCH METHODOLOGY

5.1 INTRODUCTION

In investigating the feasibility of developing a matrix to measure the impact of mobile phones in the development of rural communities, this chapter provides a design to achieve this goal. The research questions posed in chapter one assisted guiding the researcher to select a research design that would best answer the questions. The targeted community comprised different stakeholders and it was necessary to use mixed methods to reach the wider community. Research techniques such as questionnaires and various types of interviews were used to collect all the necessary information required to inform the envisaged matrix. The use of both qualitative and quantitative research methods helped the researcher in validating the research findings from the literature. To set the scene on the research that was carried out, the researcher re-introduces the research questions that guided the study.

The succeeding sections will discuss the design in terms of the techniques utilised and their relevance in addressing the research problem. The method of the study is then discussed looking at the research instruments, data collection and how it was analysed. Validity and reliability are also discussed with reference to how they were upheld in the research. The limitations of these methods are also discussed, followed by a discussion on how ethical considerations were addressed. The chapter concludes with a summary of the key issues discussed.

5.2 RESEARCH QUESTIONS

The aim of this study was to understand the effectiveness of a mobile phone in a rural community. The study further wanted to develop a matrix that could be used to help assess and evaluate the use of different features on how they impact the lives of mobile phone users in the community of Phake Rebone. Chapter Three discussed different frameworks and approaches to see if they can assist in assessing and evaluating the impact of mobile phones. In the theoretical chapter, existing frameworks

were deemed insufficient due to their limited focus on different aspects of impact such as livelihoods, communication and organisations. The research questions are re-stated in this chapter in order to show how they influenced the design of the study. The research objectives will be addressed in Chapter Seven in response to determine whether these questions were answered. The main research question that shaped this study is:

How to develop a matrix for measuring the impact of mobile phones on development in rural communities?

In order to address the main research problem research question questions were posed to help unpack all the aspects of the measurement process, development and the mobile phone. As was presented in Chapter One, below are the research questions that guided this study and their desired purpose:

What are the evaluation criteria for measuring the impact of mobile phones in rural communities?

This question was intended to identify, within the existing measurements tools, the standard used to measure impact in the use of mobile phones by different community members. If there was a criterion, it was important to understand how it was being to achieve the results.

What are the effective measurement criteria for the impact of mobile phones in rural communities?

Upon identifying the criteria in question one, the researcher needed to establish whether the standards were effective and to what extend did they support the measurement of mobile phones.

What are the monitoring tools for impact assessment of rural development?

This question focused on the general assessment of impact of rural development without focusing on any specific ICT related devices. Of importance in this question is

to note any activities that support rural development and how they were being assessed.

How are mobile phones improving the lives of the people in rural areas?

In order to measure the effectiveness of mobile phones there was a need to know how the device was being used and the value attached to it from the user's perspective.

How can a matrix assist in making the mobile phones efficient in rural community development?

Following the results that emanated from the above questions, the researcher had to determine whether there was a need for a new measurement tool to assess the impact of mobile phones in rural communities. Based on the results, she had to show how the envisaged matrix can assist in fostering the effectiveness of mobile phones.

How to develop a matrix to measure the impact of mobile phones for rural communities?

When the need for the matrix had been established the researcher needed to design the matrix. This question assisted in illustrating how the matrix could be developed and be used by ordinary community members.

5.3 RESEARCH DESIGN AND METHODOLOGY

A research design is described by Hofstee (2005: 113) as a process where the research approach will be named and discussed. This is elaborated further by Zikmund (2003: 65) as he states that it provides a plan on how the data will be collected and analysed in order to thoroughly answer the research question. Research designs can either follow a positivist or interpretivist methods. Positivist methods are interested in theory building thereby use inductive reasoning to derive or test a theory (Bhattacharjee 2012: 35, De Vaus 2001: 5). Interpretive designs in contrary focus on using data to test the theory with a deductive inquiry (De Vaus 2001: 6). These paradigms reveal the type of data that will be needed and how it can be analysed to answer the research question. The design in Figure 5.1 is an illustration of this study's

research design. In answering the research question stated in section 5.2 an interpretive design with deductive results was employed.

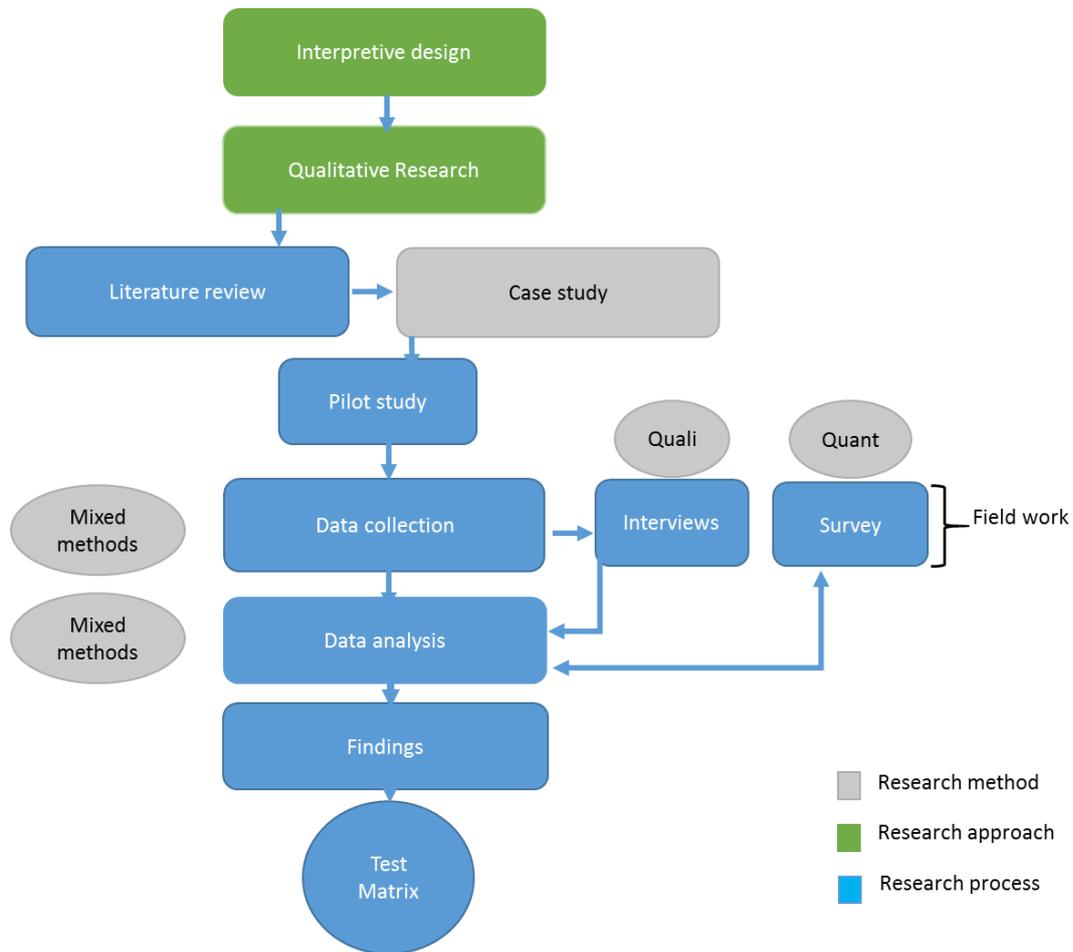


Figure 5.1: Research design

Source: Own

5.3.1 Case study

Central to this study's design is the case study method. Case studies are used in research to uncover how and why certain things happen. Thomas (2005: 9) describes a case study as a method that focuses on one thing, where the researcher looks at this one thing in depth and from many angles. Moreover, various methods can be used to inquire into the subject(s). The case study therefore becomes effective through other methods, for example qualitative or quantitative, that are used in conducting a particular research. Qualitative research is a method that uses various interpretative techniques in to understand a particular social phenomenon (Babbie 2011: 313). Quantitative research method on the contrary is interested in measurement of a particular phenomenon (Cooper & Schindler 2006: 196). According to Aaltian and

Heilmann (2010: 2), a case study can be used in different disciplines, for example, it can be used as an educational tool for understanding pedagogic processes. Furthermore, it can be used as a strategy for making sense of sociological and political outcomes. The case study can take an explorative, descriptive or explanatory method to study a phenomenon (Mouton & Marais: 43). Aaltian and Heilmann (2010: 3) state that this technique makes it possible for researchers to use various qualitative and quantitative research methods together. Interviews, questionnaires, surveys and observations can be used in this regard to collect data. The relevance of these methods in this study is to ensure that the researcher does not only know what functions of the mobile phones are used but to what extent they are used. The use of both methods will be discussed further in section 5.4.3.

According to the European Commission (EC) (2008: 15), using the case study method is beneficial in that it offers a high level of specificity and details, thus enabling concrete conclusions and lessons to be drawn. The data collected through this method provides rich descriptive data and is synonymous with the stories drawn from interview quotations of the respondents (Aaltion & Heilmann 2010: 12). However, the case study method has its limitations. Babbie (2011: 313) points out that the weakness of the case study method is that the generalisations are limited owing to a single instance of some phenomenon ascribed to that particular case. In addition, results and findings cannot be applied to other cases (EC 2008: 15). For instance, the findings of this research cannot be generalised to other rural communities. In an impact study conducted by Kanninen and Lemola (1990: 21), the same method was used and they had issues with its poor generalisation of results. Moreover, it did not provide the understanding of the total impact of the programme investigated. To overcome such challenges, other methods can be utilised to strengthen the arguments presented by case studies. For example, the quantitative research method can be used to address issues that the qualitative component fails to cover. These methods are elaborated further in the next subsection.

5.3.2 Research methods

There are various research methods that can be utilised depending on what the research problem addressed and the data to be collected. Pinto (2010: 4) describes qualitative research method as a paradigm that addresses the interpretation and

socially constructed realities. It digs deeper into society's activities and what informs them. According to Cooper (2006: 196), qualitative research helps the researcher understand the "how" (process) and the "why" (meaning) things happen as they do, while the quantitative method assists in understanding the "what" and the "how often" things happen. Conversely, Pinto (2010: 4) states that the quantitative method is a paradigm that hypothesises relationships between variables in an objective manner. Moreover, it formulates the hypotheses based on precedence, experiment, control groups and variables, comparative analysis, sampling, standardisation of data collection, statistics and the concept of causality. Quantitative studies produce results that can be generalised to other similar situations while providing explanations for predictions and causal relationships (Kraska 2010: 2). Other researchers argue that the qualitative research method carries a wealth of meaning of a concept whereas the quantitative research provides a specific concept (Yue 2010: 160). Combining the two methods assisted in avoiding the biases that are normally associated with the qualitative research method. The gaps identified in one of these methods were addressed through the other method. A similar limitation can be observed in the study of Wake (2013: 52) where a qualitative research was enriched by using mixed methods of collecting data to ensure credibility of data. The study used four different phases to collect data on mobile-based learning games by employing interviews (structured and unstructured), observations, and questionnaires.

Cooper (2006: 196) states that qualitative data is often subjective and susceptible to human error in the data collection and interpretation phases. As a result, qualitative results cannot be generalised to a larger population sample. However, quantitative research method attempts to provide a precise measurement of something, be it people's behaviour or attitude and counting of objects or events (Cooper & Schindler 2006: 198, Norberg-Hodge 2010: 117). The quantitative research method maintains the distance between the researcher and the research to avoid biasness in the results. As stated in section 5.3.1, a qualitative research method is driven by respondents' insight. These can be achieved through interviews or observations (Bhattacharjee 2012: 103). In contrary, the quantitative research method is synonymous with large numbers that are beneficial in quantifying the results. Surveys are instrumental in this regard due to their ability to reach a wider population, and therefore allow the results to be generalised for the targeted population (Aaltion & Heilmann 2010: 12). This may

also build a strong case for some case studies to be generalised in similar population demographics. Surveys can be longitudinal, meaning that they can be used to collect data over a period of time, or only at once (Kraska 2010: 12). All these methods have their limitations, which could have affected the data collection process. It was therefore important that in answering the research problem, both approaches were used for collecting, interpreting and analysing the data. According to Mouton and Marais (2010: 91), the use of multiple sources of data collection in research is likely to increase the reliability of the data.

According to Bhattacharjee (2012: 104), the joint use of qualitative and quantitative research methods is called mixed method designs. It is also termed multi-methods (Kitchenham 2010: 4, Pinto 2010: 4). Pinto (2010: 2) points out that applying various methods in a single research question assists in broadening the dimensions and scope of the research, as well as leading to a precise holistic understanding of human behaviour and experiences. Kitchenham (2010: 2) emphasises that mixed methods are important in case studies because they allow qualitative studies to be quantified and quantitative ones to be qualified. Kitchenham (2010: 2; 3) gives an example of how mixed methods can be used: a case study researcher might transform interview data on how the roles of teachers have changed with technology infusion into a display comparing who has and who has not changed with a number of technology infusion inhibitors such as infrastructure, monies and administrative support. A Fisher's exact probability test could be applied to see if there is a statistically significant difference between a teacher infusing technology and an inhibiting factor.

The former presents a qualitative approach, where interviews are used to collect data, while the latter illustrates the quantitative approach, where the statistical measures are applied for analysis. Mixed method designs are cited to be useful in avoiding biases and they allow a broader picture in impact assessment studies (UN 2009a: 2). They are also beneficial in collecting, analysing and interpreting data (Kitchenham 2010: 4).

This study used a case study method. Within the Phake community, Phake Rebone was selected as a case study to help understand the impact of mobile phones on development. The study was exploratory and interpretive in order to understand certain concepts of the research topic. According to Mouton and Marais (2010: 43),

exploratory studies assists in understanding a relatively unknown research area. Moreover, they lead to insight and comprehension of new phenomena. In addition, exploratory studies are best used with in-depth interviews and analysis of case studies. The different groups referred to were interviewed to learn on how they are using the mobile phone. The descriptive method was brought in to the design to support the exploratory. According to Bhattacharjee (2012: 7), descriptive research provides observations and detailed documentations on the researched phenomenon. Descriptive case studies allows the researcher to have rich data which its findings can be generalised (Mills et al 2010a: 5). This method enabled the researcher through the survey to interrogate the exploratory data. The use of surveys, interviews and questionnaires to understand the community and their use of mobile phones was instrumental on how the matrix could be developed. The use of interviews, however, threatened the reliability and validity of the results as the researcher could have easily become biased due to interactions with the participants. These limitations were overcome by using a mixed method design. Another shortfall with the case study method was that it involved ethical issues. The involvement of people in this type of research has ethical and access issues linked to it. Section 5.6 will discuss the ethical issues and how they were addressed in this study.

5.3.3 Technological impact and assessment

The research question as stated in section 5.2 is concerned with the measurement of mobile phones for development. The mobile phone as a tool is a technological intervention that is aimed at addressing communication issues of the society. In Chapter Two, section 2.4.2, it was reported that infrastructural issues made it impossible for rural communities to have access to ICT devices. The ability of the mobile phone to penetrate in geographical areas, which were previously excluded from the telecommunication infrastructure, suggests that this device enabled social interventions to such communities.

As a result, this study carries an evaluation research component as it aimed at measuring the impact of mobile phones in the lives of the users. Babbie (2011: 361) explains evaluation research as a research with the purpose of evaluating the impact of social interventions. In this study, however, it is not the social intervention but how the technological intervention influences social interventions. This entails asking

relevant questions, which will determine how successful a given action was (Ukaga & Maser 2004: 10). Therefore, the questions posed to the selected research sample have played a significant role towards conceptualising the evaluation tool (a matrix), which is the driver of this study. Thomas (2005: 99) reports that a case study provides optional means to conduct evaluation research. The study was trying to understand the community's use of mobile phones for various purposes such as business, community forums, communication and learning in schools. This would then lead to a matrix which is the assessment and evaluation tool. The evaluation was conducted by taking back the matrix to the community. A community group evaluated it. The feedback assisted determining whether the matrix was a true reflection of what the community required and further improving it. The study used both the qualitative and quantitative research methods.

5.3.4 Sampling

Phake is a rural area situated in Mpumalanga with five villages, namely Phake Rankaila, Phake Rebone, Phake Thabeng, Phake Phaphamang and Phake Ratlhagana (see Figure 5.2). Phake is in the Nkangala District within the Dr J.S. Moroka Municipality. The area has a population of 249 705 (STATSSA 2012b: 44). The population of Phake Rebone, which was the targeted area, has a population of 7 848¹¹. Some of the resources of these five villages of Phake are shared. The central areas were chosen for schools, a clinic and municipal offices to be accessed by all sections. The research sample comprised different people from the community of Phake Rebone. This community was chosen because it was easily accessible and a home to the researcher: that helped reduce the research cost. The other portion of the sample consisted of participants living outside this community, based on the services they offer to the community. Two techniques were used for sampling.

A non-probability and purposive sampling was used as well as random sampling. The non-probability sampling is a design which is used when the number of elements in a population is unknown or cannot be identified individually (Rawbone-Viljoen 2013: 178). It is purposive in that the researcher makes the judgement of who will best provide the most excellent information to achieve the objectives of the research

¹¹ The population statistics were sourced from the community records provided by the councillor.

(Rawbone-Viljoen 2013: 179). According to Fink (2010a: 32), the disadvantage of non-probability and purposive sampling is that they are vulnerable to selection biases. This is why the random sampling was used to complement the aforementioned technique. A stratified random sampling was used to collect the quantitative data. Ukaga and Maser (2004: 26) describe stratified random sampling as a technique where all members in the community, particularly subgroups, have an equal chance to participate. In addition, community members can be divided into different categories and number these categories to draw out a required number of participants (Ukaga & Maser 2004: 27). The participants were community members from the age of seven to over 60 years. The lowest age of seven was selected because it is the age group that was starting school, and it might have started experimenting with mobile phones.

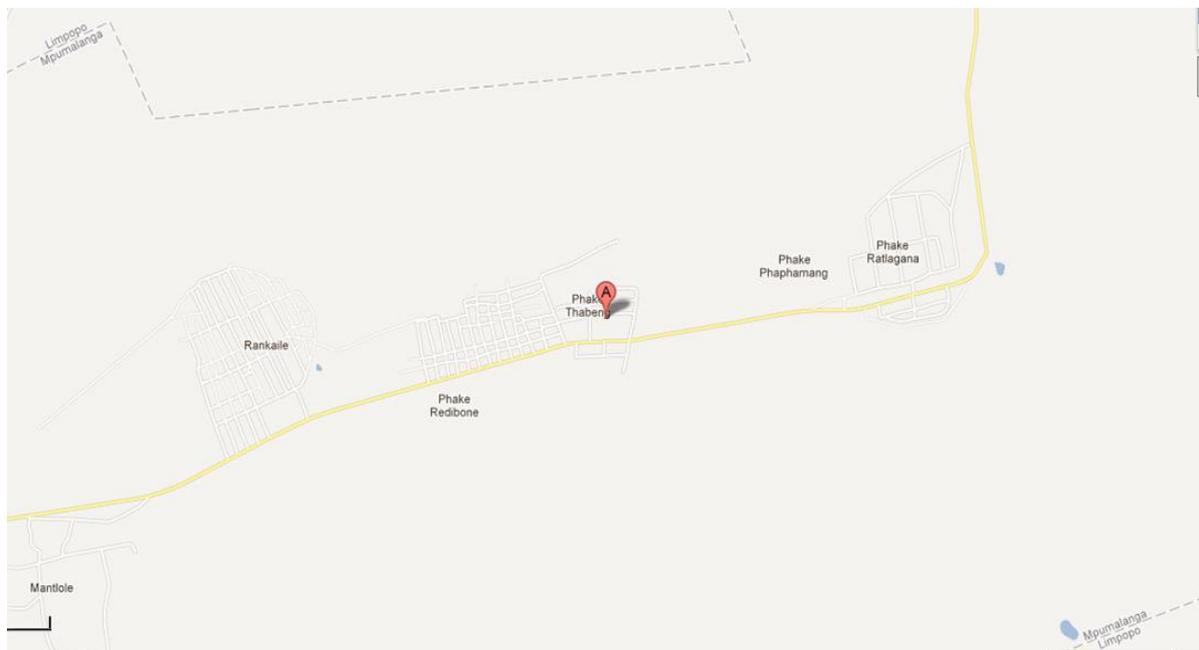


Figure 5.2: Map of Phake area

Source: (Google Maps 2012)

The community target group comprised learners (primary school to secondary school), educators, youth (those planning to start a career or have just started), women, men, elderly people, law enforcement officers, business people and municipal leaders. The resources that they have are the schools, welfare services, spaza shops and health clinic. The employed people in the community are mostly working in the city and the majority are travelling by buses to and from Pretoria that is \pm 90 kilometres away. The

area faces challenges of unemployment, particularly among the youth and many are dependent on social grants (Frere 2012: 4). The community's network is very tight and they assist each other in handling social gatherings and fighting crime. There are community policing forums (CPF) established within the community to assist in law enforcement activities and other law-related matters. The CPFs are effective, as the area of Phake does not have its own police station. The nearest police station is about 12 kilometres away in a village called Mmametlhake. The CPFs work together with the police to address criminal activities within the village. Municipal councillors lead the village, unlike other villages, and not chiefs like most of the communities in this area. The chiefs are, however, partly involved in community leadership for traditional affairs. Economic activities in this area include spaza shops, food security projects and small-scale livestock farming.

The research focused on the general usage of mobile phones by community members in education (by learners and educators in primary schools and secondary schools); the government (community and municipal leaders); businesses; law enforcement teams (CPF and police); and health centres (clinics). Figure 5.3 below illustrates the targeted groups.

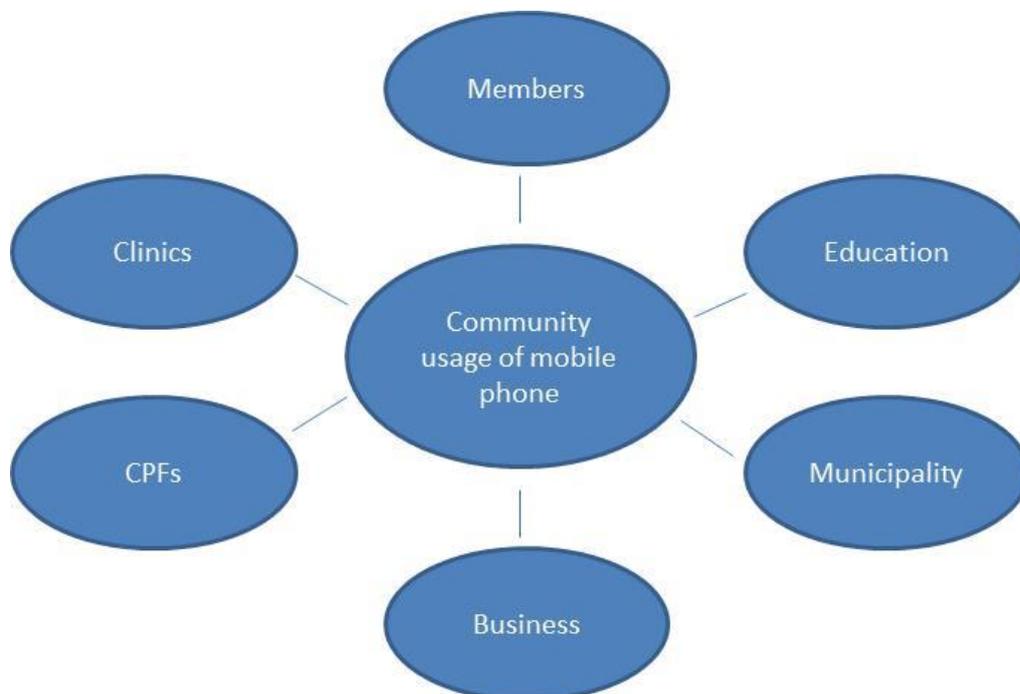


Figure 5.3: Targeted groups using mobile phones

Source: Own

5.3.4.1. Justification for the sample

According to the UN (2005: 70), rural communities have more serious limitations in terms of diffusion and usage of ICTs. Hence rural communities are being targeted for developmental purposes, especially for technological developments. For instance, a study by Ngassam, Ntawanga and Kandie (2010: 4) piloted a mobile (m)-commerce procurement system in the rural community of Kgautswane in South Africa. Their study was aiming at extending the utilisation of mobile phones by incorporating the procurement system in a retail environment (Ngassam et al 2010: 4), thereby exposing the community to m-commerce. While the diffusion of mobile phones and its services are reaching these communities, some social challenges remain. This study therefore looked into how the technological intervention has impacted the social life community of Phake Rebone. The community of Phake Rebone is greatly affected by teenage pregnancy and unemployment. According to GTZ (2012: 3), 70 per cent of the people in Mpumalanga are living in poverty. In undertaking the research in this area, the researcher was able to understand the impact of mobile phones, as stated in Chapter One sections 1.2, 1.2.1 and 1.2.7, on how they are playing a developmental role. This community was chosen because it was accessible to the researcher as it is her home and this reduced the cost of research in terms of travelling and other logistics.

The in-depth interview sessions were held with different groups to understand how they each use the mobile phone. A total of 401 people participated in the study. Altogether 56 people from the general community were interviewed. They comprised the education group, in which 13 learners and three teachers were interviewed. A non-purposive random sampling was used for learners of all three phases, namely primary, middle and secondary school. Within the educators group's the researcher's intention was to randomly select educators from the foundation to the intermediary phases of the Refitlhile. However, the educators were not interested in the research and only the principal of the school was interviewed. In order to get different perspectives of educators, two educators within the community who taught in similar rural primary schools were also interviewed. In the community and business group 19 people participated. A non-probability random sampling was used for the community where researcher chose a participant from one household of the five streets. Participants were chosen based on their age group, employability and whether they had access to a mobile phone. Only three businesses were identified and all were interviewed. The

health group had an HIV/AIDS centre and a health clinic. A non-probability sampling was used for both groups. Three health clinic workers representing their respective levels were chosen. The different levels were nurses taking vitals, nurses conducting consultations and the counselling representatives. A volunteer worker and the centre manager represented the HIV/AIDS centre. In some groups all members were interviewed, as the groups were smaller. Such groups included CPFs and community leaders. Refer to Table 5.1 for the sampling summary. Provisions were made for the researcher to increase/decrease the sample of the learner and community group during the interview process so that the information not received can be enacted for the expanded group.

The quantitative survey surveyed 345 people from the wider community. A stratified random sampling was used where every fourth household was interviewed focusing on those who had mobile phones. In the initial plans of the study the researcher wanted to include focus groups to extract more information in certain groups should there be any gaps on the collected data. However, all the research questions were entirely covered by the interview and the survey processes. The final sampling was with the evaluation of the matrix. A simple random sampling was conducted to evaluate the developed matrix. A small size was used targeting community members who were not part of the survey and those who participated. Two participants were new to the idea of measuring the impact of mobile phones whereas the other three had been exposed to the idea.

Group	Method	Number
Businesses	Stratified/ structured interviews	3
Community leaders	Random/structured interviews	7
Community members	Non-probability random/ stratified random/structured interviews	16
CPF	Stratified/structured interviews	4

Group	Method	Number
Educators	Non-probability purposive/structured interviews	3
Health workers	Random/structured interviews	5
Learners (7-17 years)	Random/ structured interviews	13
Matrix evaluators	Simple random sampling	5

Table 5.1: Community sampling

Source: Own

5.3.5 Data collection

Since the study was aimed at developing a matrix to measure the impact of mobile phones on the community, the collection of data was done using multiple methods. In-depth interviews, observations and surveys were used to collect data. The process of data collection entailed preparing research instruments and piloting them in the community. Schreiber (2008: 2) defines a pilot study as a small-scale implementation of a larger study which often involves a small number of participants. Piloting is imperative in that it enables the researcher to determine the effects of the most important measuring instrument and eliminate them (Mouton & Marais 1990: 95). In addition, they provide an opportunity to examine adjustments or alternatives on the research instruments (Schreiber 2008: 3). For example, the developed questionnaires were tested through the pilot to ascertain if the posed questions were well understood by participants, and if not, what improvements could be made before undertaking the study. Data was collected using the local language - Setswana. The transcripts were then translated into English. In-depth interviews were used for a smaller group of the study to identify the uses of mobile phones and their perceived benefits among different groups of the community. The interviews helped in determining whether participants would be interested in a tool that could measure the effectiveness of mobile phones and if they would like to be trained on using such a tool. It also assisted in determining the type of questions to be used for the survey.

A survey was used for a larger group of the study to confirm data on the usage, measurement and training of the mobile phone and the matrix. Observations were

used as another method of collecting data. Unstructured observations are more flexible than structured ones where a well-designed guide is used and scheduled for specific times (Shuman 2010b: 82, 83). Moreover, unstructured observations allow the researcher to observe different things at different times. Unstructured observations were therefore used among some groups (during interviews) on how frequent the mobile phone was used. Wellington and Szczerbinski (2010: 81) state that frequencies of certain events or interactions in the observed situation may be recorded over set time periods to enable quantitative analysis of the data. Interview sessions were also used to probe on observed usages of the mobile phone. The data collection instruments are discussed further in the following subsections.

5.3.5.1 Research instruments

Research instruments refer to tools such as surveys. According to Fink (1995: 1), a survey is a system for collecting information to describe, compare, or explain knowledge, attitudes and behaviour. There are four types of these instruments, namely self-administered questionnaire, interview, structured record review and structured observation (Shuman 2010a: 42). The questionnaires can either be open ended or closed, depending on the type of data required. Fink (2010a: 1, 2) states that the questions are typically arranged into mailed, taped or self-administered questionnaires and into in-person or telephone interviews. For purposes of this research, structured open-ended questionnaires were used to collect the qualitative data. Structured closed questionnaires were used for the surveys. A standard questionnaire for both interviews and self-administered surveys were used to collect data. The research team, on a face-to-face encounter, administered the questionnaires. The reason for this was that most people in the targeted community have low literacy levels. Self-administration of questionnaires would have led to invalid data. The administration of the questionnaires by the research group was a means to avoid a situation in which respondents would struggle to read and fill in the questionnaire.

5.3.5.2 Interviews

The first round of data collection was done through individual in-depth interviews. Babbie (2011: 263) defines an interview as a data collection encounter in which one person (an interviewer) asks another person (a respondent) questions. The interview may be done face to face or by telephone (Shuman 2010a: 43). The interview uses

structured and unstructured methods. In a structured interview, the researcher determines the questions, controls their order and pace, and this technique allows probing (Shuman 2010b: 98). Unstructured interviews are informal and takes form of a conversation (Shuman 2010b: 96). Face to face structured interviews were conducted for this study. This was to enable the researcher to probe on certain questions that might have been overlooked when the questionnaire was formulated or based on reactions of the respondents when they answer certain questions.

According to Babbie (2011: 263), the presence of an interviewer generally decreases the number of “I don’t knows” and “no answer”. Moreover, interviews assist in clarifying a question, in case the respondent does not understand, and this increases the rate of receiving relevant answers. Babbie (2011: 266) is of the opinion that sometimes interviewers need to probe in order to get responses that are sufficiently informative for analytic purposes. This makes sense, and for the purposes of this study, probing assisted in making sure that the second round of the survey addressed other variables relevant to assessing impact that were not included prior to the interviews. The questionnaire was structured to assist the interviewers to pose similar questions and also to make sure that the data collected is consistent to ensure reliability. Babbie (2011: 264) further advises that when conducting interviews, interviewers should guard against being biased or leading respondents to certain answers. This can be achieved by the interviewer remaining neutral throughout the interview. Observations were important in this case study as they enabled the research group to see things not disclosed by participants with regard to using mobile phones.

5.3.5.3 Research process

The collection of data took six weeks. The first week was used to pilot the interview questionnaire. The questionnaire was piloted with ten people ensuring that all the groups were represented. The pilot process provided valuable insight used to revise the questionnaires. The interviews were conducted by the researcher and an assistant living in the community. The assistant was trained on how to conduct the research and later shadowed the researcher for a day to see how an in-depth interview is handled. When the interview process was completed after two weeks, the initial survey was updated to include some of the concepts that were not addressed. The researcher then selected a team of seven matriculates to assist with the administration of the

survey. As stipulated in section 5.3.5.1, the research assistants assisted in ensuring that participants understood the posed questions and the correct responses were entered. Since the questionnaire was in English, research assistance helped participants by explaining what each question required from. The research assistants were then trained to prepare them for the fieldwork. The 350 questionnaires were shared amongst the seven research assistants and the surveys were completed in three weeks. Of the 350 surveys administered, five were discarded. Four were discarded as some participants were interviewed more than once. In cases where the research assistant visited the same household twice, some participants would not disclose that they have been surveyed. This led to duplication of the results. This was noticed when the researcher was capturing the data as names, age and the type of mobile phone would be similar. The other questionnaire was invalid, the participant did not have access to a mobile phone at all. As such the five questionnaires if included in the analysis they could have tempered with the reliability and validity of the study. With that being said the next section discusses reliability and validity in research. The last phase of the research was to test the developed matrix with a few community members. The researcher selected five people to test the matrix.

5.3.6 Reliability and validity

According to Yue (2010: 9), validity is essentially concerned with whether the claims, implications and conclusions provided by research can be justified. Although the nature of qualitative case studies does not allow them to be generalised, if valid, the results can be generalised to inform theory and the case study (Yue 2010: 6). Validity can also be attained if the research sample is representative. In Hollow's study, they increased validity by ensuring that the participants of the baseline study were representative of the targeted audience (Hollow 2010: 503). In addition, Miller (2008b: 3) states that validity can be heightened by ensuring that research procedures remain coherent and transparent, results are evident and research conclusions are convincing. Validity goes hand in hand with reliability as they both contribute towards the quality of data.

Reliability is defined as accuracy or precision of an instrument in measuring the "true" standing of persons to whom a particular test was administered (Thomas 2005: 2). Furthermore, it serves to estimate the stability, predictability or dependability of data

collection, interpretation and analysis (Miller 2008b: 2, Thomas 2005: 2). Through reliability, when different researchers to collect data use one instrument, they will be able to collect similar data. Equally, the data will produce similar results when assessed by different people. Applying triangulation in research assist in increasing the reliability of the study results (Aaltion & Heilmann 2010: 10). However, Mathison (1988: 14) argues that triangulation alone cannot ensure the reliability and validity of data. She points out that triangulation, as a strategy, provides evidence for the researcher to prove some social phenomenon, “but that the triangulation strategy does not, in and of itself, do this”. This is the result of the different results that are borne in this strategy such as convergence, inconsistency and contradictions. Often convergence does not occur with some results hence there is a need for the researcher to explain some inconsistencies and contradictions arising from triangulated data (Mathison 1988: 15).

The validity and reliability of the research can be achieved when the correct research design is used. The research was designed in a way that it will support both the data collection and analysis processes. Issues of validity and reliability were addressed in this study by reaching a representative sample of the targeted community. The research was designed to use a case study method (refer to section 5.3) in order to address the explorative and interpretive nature of the study. To enquire and understand certain concepts of the research topic, mixed methods were used to collect and analyse the data. Qualitative and quantitative research methods employing surveys, interviews, structured questionnaires and observations were selected for the collection of data. The use of interviews, surveys, as well as coding, deductive, inductive and content analysis were used for the analysis of data. As discussed in section 5.3.1, 401 participants were interviewed and surveyed.

Prior to the data collection process, questionnaires were piloted in the targeted area to examine whether the set questions were clearly understood by the target group and if they would yield results that will answer the research problem. Questionnaires were structured in such a way that would ensure that the participants were answering similar questions to maintain consistency of results. Due to low literacy levels of some community members a decision was taken to have research assistants to assist in administering the questionnaires. Although the research team was guided by an

English questionnaire whilst gathering data and were using Setswana language (which was understood better by community members) to relay survey questions, measures were put in place to maintain data quality. The researcher was aware that the use of the English questionnaire may impact the reliability of the collected data by the research assistants. The researcher recruited matriculants who had a better understanding of the English language to help participants with the administration of the questionnaires.

Three other strategies were further used to ensure that the collected data was consistent with the posed questions. Firstly, the piloting process carried out by the researcher assisted to ensure that they were not asking ambiguous questions even though the guiding questionnaires were in English. Secondly, the research assistants were thoroughly trained to ensure that they clearly understood the questionnaires. Part of the training involved sessions where they would practice relaying the questions with fellow colleagues and the researcher. Lastly, data auditing was conducted to verify the collected data. According to Ukaga and Maser (2004: 48), a data audit is necessary in order to ensure reliability, and the audit may be achieved by making sure that the entered data make sense. As part of the auditing process a few of the questionnaires were found to be unstable and not dependable. The data that was corrupt was then discarded as part of validation. This was achieved by reviewing the provided answers to check if they corroborate with the questions posed (Hollow 2010: 502).

The aforementioned measures justify the reliability and validity of the data that was collected from the community of Phake. This was further achieved by ensuring that each participant's data was entered only once. Interview notes were used to enable the researcher to capture the participants' responses.

5.3.6.1 *Triangulation in research*

The use of these multiple methods of data collection is termed triangulation (Mathison 1988: 13, Yue 2010: 91). In Olsen's (2010: 4) view, triangulation means the mixing of approaches to get two or three view points on the objects being studied. The authors' definitions support each other, as it is evident that through the use of various methods, different viewpoints will be shared. Mouton and Marais (1990: 91) further state that by using different methods of data collection, researchers are able to compensate for the

limitations that come with each method. Pinto (2010: 9) highlights that triangulation often leads to diverging viewpoints, reflecting the logical reconciliation of the qualitative and quantitative studies. Furthermore, the divergence can, however, lead to a productive process where concepts can be modified and adapted in order to address differing study results (Pinto 2010: 9). Triangulation, in this study, was achieved by using literature review, interviews, surveys and observation for the collection of data.

Literature review is a form of secondary data collection whereby articles, books and reports are used to gather information about the researched phenomenon (Bhattacharjee 2012: 21). Moreover, it is at this stage that the researcher can determine whether the problem being researched has been answered or not. In conducting a literature review the researcher was able to identify the gaps in studies that have dealt with a similar concept. The literature findings were therefore used in compiling the questionnaires used for piloting the study. An interview is an oral question and answer session between the researcher and the respondent whereby the former is uncovering information on the researched phenomenon (Mills et al 2010b: 4). They further allow the researcher to ask probing questions on provided responses. Interviews were used to uncover the usage of mobile phones by the studied case. Surveys are used to reach a large number of people to give their opinion on the researched phenomenon (Ukaga & Maser 2004: 33). They allow respondents to take their time in answering the posed questions. This study used surveys to determine a number of people using various features/applications. The use of different cases, i.e. leadership, education, health and community groups within a bigger case study brought different dimensions to the research results. Each group was interviewed to understand how they individually interacted with the mobile phone. Their results were later incorporated into the survey to test how the wider population identifies with them. The observations of non-verbal messages during interviews also assisted in identifying other dimensions to the research, which will be shared in Chapter Six.

The triangulation, as advised by Mathison (1988), was used to contribute towards validity and reliability of data. Independent data sets emanating from various methods were also used to validate the data. For example, the interviews informed and verified the questions that were prepared for the survey. The mixed methods of collecting data

helped in identifying and addressing the inconsistencies and contradictions arising from the data so that the researcher could attempt to answer the divergence or convergence arising. Applying methods such as content, thematic, graphic and cross analysis triangulated the analysis. Triangulation was effective in this study both on the data collection and analysis stages. The data that shaped and guided the results of the study was collected in various ways starting from the literature review to understand the problem and identify gaps to taking the defined problem to the field in order to assess if the people can benefit from the designed matrix. Interviews, surveys and observation have all shared rich data that did not only support each other but inspired different themes for analysis. This method enabled the researcher to use thematic analysis in interpreting the results whilst looking at how different patterns emanate and contribute to a specific theme. Mixed variables also showed how gender, age, and perspectives for instance influence certain attitudes towards mobile phones. Thus, triangulation did not only assist towards the validity of the results but also understanding how different views are formed regarding mobile phones and their effectiveness.

5.3.7. Data analysis

Mouton and Marais (2010: 103) define analysis as the resolution of a complex whole into small(er) parts, using synthesis to reconstruct meaning. Similarly, Ukaga and Maser (2004: 85) describe analysis as a process in which through interpretation one can understand the data collectively like a “forest” and identify the “trees” emanating as key. Through analysis, the constituent variables that are relevant in understanding a phenomenon or an event are isolated. The variables or factors were pulled out of the data using content analysis. According to Cooper (2006: 196), content analysis assists in analysing written and recorded material, including the personal expressions by participants. The participants’ responses were coded in order to ensure that the process of capturing the data adheres to the researcher’s goal of maintaining validity and reliability. The coding also assisted in conducting a statistical analysis. This was achieved by referring into the coded data to extract the frequencies of how some themes occur. Cooper (2006: 200) advises that data has reams of words that need to be coded to make analysis manageable. When data is coded it is easier to keep track of emerging patterns and relationships (Ukaga & Maser 2004: 51).

The use of inductive and deductive strategies assisted in the analysis and interpretation of data. According to Mouton and Marais (1990:103), the inductive strategy is appropriate for exploratory and descriptive studies. This is because the research approach is less structured and the researcher relies on the data to derive patterns, relationships and hypotheses for testing. Mouton and Marais (2010: 103) further highlight that the inductive and deductive strategies can be used together in descriptive and explorative studies. Moreover, the hypotheses can be developed at data analysis level to be tested, and this would be deductive. In this light, the study adopted both the inductive and deductive strategies. The inductive strategy was employed to gather information that was required for the development of the matrix. This was followed by the deductive strategy where the information collected was used to produce indicators that were used to develop a matrix and its guidelines.

Since the study was targeting different groups, analysis was done for individual groups. This was followed by a cross analysis of the different groups in the case study. According to Cooper (2006: 217), cross analysis assists in determining the differences and similarities of trends of the case studies. The nature of this study also required that patterns be used in analysing data. Mouton (2001: 108) states that when the pattern trend is used when analysing data, the data then becomes easily manageable. The study was structured in a way that the indicators chosen for measurement purposes needed to be understood. As a result, patterns and themes assisted in grasping meaning from the participants' responses. Patterns and themes were helpful in identifying usage behaviours of mobile phones by different groups in the community. According to Staller (2010: 8) thematic analysis can be conducted by closely examining the texts from interviews, field notes, applying codes and developing themes. The information from the questionnaires also served to identify significant themes that were then used for the analysis (Hollow 2010: 180).

Cross-validating the data collected through interviews, surveys, evaluations and observations triangulated the analysis. According to Bailey (2010b: 77), this form of triangulation is useful in verifying the data from different methods. For example, in this study, the analysis of the in-depth interviews was confirming the data from the surveys and observations as well as identifying new trends emanating from the results. The records of mobile phone usages were not documented, as there was no

documentation at all from the community. Analysis in this instance was only that of the secondary data. The results of the interviews, surveys and observations will give the community a collection of new information about their mobile usage history when the final results are shared. Hawtin and Percy-Smith (2007: 98) are of the opinion that a researcher needs to determine the number of variables that will be used and the relationship between those variables. Mixed variables were used for this study. Mixed variables refer to the use of different variables such as univariate, bivariate and multivariate.

Univariate is normally used to analyse numerical data, bivariate looks at the relationship between two variables, and multivariate looks at more than two variables (Hawtin & Percy-Smith 2007: 98). The analysis assisted in identifying variables which influenced the development of a matrix. For example, the variable of age was used to uncover how the young group used the mobile phone compared to the elderly in the community. Furthermore, the gender of participants was used to understand how they interacted with the mobile phone. Patterns drawn from these included identifying the difference in education, health and community groups' usages.

Content analysis was used for the smaller groups. This was followed by cross analysis of the themes arising from different teams. The variable of age was also used to compare usage patterns of the elderly and younger participants. Communication was the main theme that cut different across all the groups. Other important themes were livelihoods, which was characterised by sub themes like employment, community services and banking. Latent themes that were also foregrounded by the challenges noted in the community were recorded. Digital divide was noted, although it was highlighting a different type of exclusion. Freedom was another latent theme discovered. The concept of 'freedom' as emphasised by Sen (2005a: 5) was also observed as a theme which influenced the sub-theme of negative perceptions. The themes drawn from the findings further included livelihoods, empowerment, safety and training. Table 5.2 below shows the themes that emanated from both the qualitative analysis. The quantitative data to a certain extent lead the researcher into an inductive analysis following on the themes inspired by the questionnaire themes. This, however, has limitations as the researcher's focus is guided by the implied themes, which challenges objectivity of the analysis. The quantitative method has nevertheless

complemented the qualitative method by providing numbers to support the deductive accounts of the research.

Themes	Sub-themes	Analytic method
Communication	Voice; Messaging platforms and social networks	Deductive
Livelihoods	Employment; community services; banking	Deductive and inductive
Digital divide	Connectivity; Internet; social networks; mobile banking; knowledge gaps	Deductive
Freedom	Usage; negative perceptions; eagerness to use mobile phones; adaption in usage	Deductive and inductive
Empowerment	Learning and research, information	Deductive and inductive
Safety	Emergency; security;	Deductive and inductive
Training	Underutilisation; misuse;	Deductive and inductive

Table 5.2: Analytical themes

Source: Own

Computer aided programs such as GoogleDocs and Microsoft excel were also used in the management and analysis of data. Computer aided programs are said to be useful in managing, organising and retrieving large amounts of data (Staller 2010: 9). Staller further advises that some qualitative software are not designed to analyse data like quantitative ones, as a result they require the researcher's interpretative and analytic procedures of how the tool will be exploited. It is in this light that GoogleDocs was used to generate basic statistical analysis. Microsoft excel was used for interpretation of data and creating diagrams to present the results. This included graphical representation of data that strengthened the qualitative analysis. According to Pertl and Hevey (2010: 4), graphical representation display data in a way that makes it easier to detect unexpected patterns whilst providing a rich data structure.

5.4 EVALUATION OF THE RESEARCH DESIGN AND APPROACH

The decision to use a case study approach to study the community of Phake was to enable the researcher to understand the researched phenomenon. The design was efficient in that the research question was sufficiently answered. Part of assessing the desirability of the design is the resources available to the researcher. The methods used matched the researcher's expertise, time, budget and supporting team. The use of mixed methods to collect and analyse data helped in understanding the phenomenon better. The incorporation of quantitative methods to the design assisted in enabling the researcher to generalise the results to the wider community of Phake Rebone. Had the researcher focused only on the qualitative methods, this would not have been possible. The rich stories uncovered would only be limited to the 51 interviewees. The ability to amend the design came in valuable as the initial planned focus groups were stopped because data from the interviews and surveys was sufficient in answering the research question. Another amendment to the design was that of including the evaluation of the matrix. The initial plan was not to test the matrix but as the data was analysed, it became evident that to strengthen the results of the study the evaluation would be necessary. The design was then amended to ensure that the developed matrix be taken back to the community for testing. This was to ensure that the indicators drawn from community data were clearly translated into this tool.

Employing a participatory mixed method approach to gather data that informed and assisted in the evaluation of the matrix further enriched the approach. The process of revisiting the community in every phase of the research ensured that the matrix was developed based on the needs of the community. The matrix is not only based on what other assessment and evaluation tools could not provide (refer to Chapter Three) but on what the targeted community required. The matrix therefore resulted from the community's participation in the research process through informing indicators and providing feedback on the matrix prototype. The community was further involved by evaluating the matrix to see if it was really addressing their needs.

In as much as the design enabled the researcher to answer the research question, there are some shortfalls. Firstly, the case study was supposed to only involve the

educators who are teaching in Refitlhile Primary School. The educators could not avail themselves for the interviews for their lack of confidence in the use of mobile phone. As a result, the researcher had to supplement the educators by interviewing those educators residing in the community. The number of the education group went down from five to four. The changes did not affect the study much as the co-opted educators were teaching in the nearest villages. This assisted the researcher in staying on track in terms of reaching the right people. Secondly, the observation instrument was not as successful as other instruments. The observation instrument was not successful, as the researcher could not spend more time with participants to observe their mobile phone usage. The time spent with participants was 35 minutes on average. The researcher was expecting to observe the interactions with the mobile phone during the interview sessions. However, this did not yield sufficient results, as a majority of participants did not have interactions with their mobile phones during the dedicated interview period. It is evident that such observations require researchers to spend more time with the observed. This, however, is more efficient in controlled environments as in the study Wake (Wake 2013: 48) where the use of mobile phone was studied in classrooms with specific groups. Although data from this method was small, triangulation of the analysis helped to close the gap. The results emanating from the observations were incorporated in the survey to get more views from other participants. The triangulation also enabled cross validation with other interview results on a similar observed behaviour (Bailey 2009: 77). This assisted in determining whether the observed behaviour applies to other participants. Finally, the decision to incorporate the matrix testing came with burdens in terms of financial plans. Including the testing meant that the budget had to increase and the researcher struggled to get funds on time to complete this task which impacted the sample to be reached for this task. Upon settling the financial issues for travelling, the decision made to test the matrix with a small group in order to ensure that they understand what it is, what it can do, and if they can use it.

5.5 LIMITATIONS

The limitation with case study design was that it is subjective and cannot be generalised (Greene & Henry 2005: 120). The results of this community will not be generalised to prove cases in closer villages. The sharing of resources as explained

in section 1.6.1 enabled the researcher to extract more information from the people who share some resources with the community of Phake Rebone. A longitudinal study of at least five years would have been good in measuring the impact of mobile phones and conducting a thorough evaluation on the proposed matrix. Another challenge was with regards to interest in participation. The educator group of Refitlhile primary school were not willing to avail themselves for interviews. This could have been due to their low confidence with regards to the use of ICTs. However other educators in the community who are teaching in the nearest villages were then included to the sample. The males in the community were also not willing to participate, therefore we had more women than men in our study.

5.6 ETHICS

Ethical issues are an important consideration in research. The case study involves interaction with people, which meant the researcher may intrude their personal space (Babbie 2008: 67). Aaltian and Heilmann (2010: 21) contend that the nature of a case study renders the researcher to become more like an insider in the organisation of targeted community as compared to more objectivistic research approaches, and the more the researcher is accepted as an insider, the more ethical consideration is needed. Ethical considerations involved receiving permission from the researcher's institution to conduct this study. Secondly, the researcher made a request for access to the community leadership and explained to them the purpose of the study so as to obtain their support. This also enabled the community members to feel comfortable in participating in the study. Thirdly, the researcher provided the participants with a consent letter which explained the purpose of the research and that the participants are not forced to be part of the study and they could withdraw whenever they felt uncomfortable. The inclusion of participants who were minors required that their parents or guardians give permission for their children. The consent forms of learners less than 18 years were therefore signed by parents or guardians. Lastly, confidentiality of the participants was addressed by making sure that anonymity (by changing names) was practiced where the names of a participant is required. For example, when a respondent is quoted, a fictional name was used. According to Babbie (2008: 69), in a scientific research the identity of participants should be protected.

5.7 CONCLUSION

A case study approach was selected as a method of study to investigate whether the impact of mobile phones in the development of rural communities can be measured. Mixed methods were considered to be relevant in addressing the research problem. Methods such as surveys, interviews, evaluations and observations were selected for data collection. The methodology section discussed the use of both qualitative and quantitative research methods. A distinction was made between the two methods and how they complement each other in carrying out this study. It was stated that the quantitative research method assisted in closing the gaps arising from the qualitative research method. The issue of generalisation and the explanation of causal relationships is where the quantitative research method played a role. Qualitative and quantitative research methods were both used in collecting, interpreting and analysing data. Triangulation was also discussed, paying attention to its pros and cons. It was decided that the triangulation would be conducted on data collection and analysis levels of the study. Sampling; data collection; validity and reliability; and data analysis also formed part of the methodology section. Limitations of the study were based on the lack of generalisation of the case study to other communities. Ethical considerations included securing the ethical clearance from the university, as well as informing the participants of their right of participation in the study. Anonymity on presentation of data was identified as another means of protecting the participants' identity. The next chapter provides an overview of the targeted case study.

CHAPTER SIX

6. CASE STUDY PRESENTATION AND ANALYSIS OF FINDINGS

6.1 INTRODUCTION

The previous chapters explored the use of mobile phones, particularly in rural communities. This was done in order to understand how the device was being used and if there were measuring tools to assess and evaluate their impact in the lives of the users. The measurement aspect was important for this study as it enabled the researcher to determine if there was a need for new measuring tools or if the existing ones could be applied to this case study. If they could be applied, it was also necessary to determine how they could be applied in a rural context. The literature review chapter was helpful in determining the availability of such tools. It was discovered that only one measuring tool for mobile phones designed for micro-traders in Ghana existed. As a result, a field study was conducted to understand the usage of mobile phones in the community of Phake Rebone. The questionnaires were formulated based on the study's research questions and other important findings that emanated from the literature chapter (see Chapter Two). The questionnaires were drafted for both the qualitative and quantitative data collection as presented in annexure A and B.

This chapter presents and analyses the results of the Phake Rebone case study. A detailed discussion of findings will be provided in Chapter Seven. The findings are presented with a focus on core groups: education, health, governance and community relations. The findings are based on both the qualitative and quantitative studies conducted. The presentation of results is in two phases. The first part discusses the base data and the themes. This focuses on the state of the entire community with its different groups, the core of the research. The second part discusses the mobile phone usage. The section discusses access to mobile phones, usage by different age groups, the community's eagerness towards the use of these devices and stereotypes around mobile phones that emerged during the data collection process. Subsequent to this is the section on security and safety, which addresses concerns from community members on the use of mobile phones and how emergencies are handled through the use of these devices. This is followed by a discussion on how the mobile

phones entertain the community. Training on the usage of the mobile phones is also discussed, focusing on underutilisation, knowledge and introduction of online courses. The chapter is then concluded.

6.2 COMMUNITY THEMES OVERVIEW

The main themes that emerged from the thematic and numeric analysis of the first data set were livelihoods, safety, digital divide, empowerment and training. Livelihood was primary to community, leadership, CPF, learners, health workers and local businesses. Livelihood encompassed the need for employment, how they survived and caring for each other. The collectiveness and caring for each other was depicted from the CPF and community leaders' need to create a harmonious environment. The learners' aspirations to further their studies and become professionals say they care about their livelihood. The duties of the health workers particularly the PHBC who were doing the HIV/AIDS voluntary care portrays how the people are looking out for each other and uphold the community's livelihood. Safety was another paramount theme enshrined by the CPF who ensured that crime, domestic violence and feuds are resolved within the community amicably so as to rebuild harmony between the affected parties. The leadership team was also playing a role in this theme. The digital divide theme concentrated on the issues that are limiting users from using the mobile phone and related services. The MNOs' failure to keep their network towers up to date means some communities' needs to rely on old infrastructure, making communication difficult for them. Digital divide was also evident at a school level where learners outpaced educators. The fourth theme was empowerment, which identified the manner in which people were being empowered by mobile phones using services such as the Internet to learn new things. Of the same importance was the training theme, which was accessed from other organisations to further development of educators and some health workers. The theme of empowerment is a requirement for the business group as it is evident from their challenges that they need to be equipped on how to manage their business and remain competitive to grow. The next section presents the findings and provides a summary of the themes that were noted in different groups.

6.3 THE COMMUNITY

A community, for purposes of this study, was defined as a geographical area in a village with its own constituency of people (refer to Chapter One, section 1.2.1). These people are those who reside in it as well as those who provide business, health and educational services to the community. It is governed by a political structure and sensitive towards issues of gender. This community has its own economic activities and depends on the municipality for services such as water, electricity, roads and provision of school infrastructure. Its livelihood is dependent the active members to find employment within and outside the village. The findings of this study confirmed most of the issues that were mentioned in Chapter Four regarding the community of Phake Rebone. Issues such as high unemployment rates, the interconnectedness of the community and the socio-economic landscape, among other things, were in line with the initial report. The unemployment rate is quite high and the unemployed depend on their parents, spouses or social child grants. The qualitative data captured 45 per cent of the sampled community members who were unemployed. Tables 6.1 and 6.2 show the breakdown of the community livelihoods and distribution of social grants.

Livelihoods	Percentage
Going to school	28%
Pensioners	9%
Employed	15%
Trading	3%
Unemployed	45%

Table 6.1: Community livelihoods

Source: Own

Distribution	Percentage	Supplementary activities
Pension grants	25%	None
Children grants	73%	Trading (1 person)
Disability grants	2%	Trading (1 person)

Table 6.2: Social grants distribution

Source: own.

There are very few entrepreneurial activities present in Phake Rebone. However, the community has a number of survivalist businesses. Members of the community who are involved in the trading of goods do not regard themselves as being employed. Two of the five involved in survivalist businesses mentioned that they are still looking for a job. Another two of those involved in survivalist businesses were receiving disability grants. The livelihood theme came out strong and this was evident in the remarks of the affected youth captured below:

“I have never worked before; I depend on child social grants” (Tilly);

“My grandmother takes care of me” (Nomasonto);

“I have four kids and use their grants to survive. I am also renting the shop that I used to own” (Andy).

There are various community initiatives that are carried out in order to ensure that there is unity. These initiatives include groups that are formed to resolve rising domestic and communal violence or misunderstandings. The community has various ways of resolving issues on its own before involving external bodies such as the police and social workers. The community prefers to solve problems internally through the platforms they have formed.

“It is important to help in our community especially when people seek help. It is better than people to go to the police where they will have to travel at a cost. We help people get necessary help like those who are sick or weak, we take them to the clinic and sometimes we take initiatives by calling the ambulance or paramedics where necessary” (Josephine).

There is more collectiveness than individuality, for example, each street has a committee that attends to the needs or challenges of the residents in that street. The forum functions in addition to the community leadership, the CPF and small projects' committee. When all these groups cannot solve a complaint raised in the community, they escalate it to the ones who are more capable of resolving it. For instance, when the residential committee cannot resolve a family matter they will refer it to the social

workers. The community holds social gatherings called “societies”. These society groups either cater for one gender group or for both, depending on their purposes. These gatherings are also used as platforms for sharing information on how best to resolve issues that arise in the community. The portrayed collectiveness echoes the livelihood theme only this time enacting how the community members relate.

Both the qualitative and quantitative data did not only confirm high unemployment rate but the reliance on social. The livelihoods of this community are therefore endangered by poverty, as most people cannot fend for themselves. The next subsection looks at the community infrastructure and related challenges, followed by a look at the groups that make up the community of Phake Rebone.

6.3.1. Community infrastructure

The community has access to all the basic education institutions, namely primary, middle and secondary schools. The Refitlhile primary school is located in the community and both the middle and secondary schools are located in Phake Thabeng, which is less than a kilometre away from Phake Rebone. Although the primary school is able to accommodate all learners coming from the community and the nearest villages, it has a problem of overcrowding. Refitlhile primary had 398 learners and their classroom carries a minimum of 35 and a maximum of 59 learners (Mark). Additional, illustrated in Figure 6.1, shacks have been built to accommodate learners.



Figure 6.1: Refithile Primary School classrooms

Source: Own

The community also has a clinic, which is based in Phake Thabeng, less than a kilometre away and located next to the secondary school. The main challenge that the community has, as observed by the researcher, is access to running water. They use boreholes to get reliable access to water, which is costly. Those without boreholes have to buy water. There are municipal pipes and taps that are supposed to supply the community with water. However, the community cannot get water from these taps when needed. The water is only available at a certain period. This means that they have to buy water. The community reported that electricity is also a challenge, especially during harsh weather conditions. When it is windy or when there are heavy rains the community experiences power outage. When the power is out, it takes a long time, sometimes a full day for it to return.

Other noted infrastructural challenges are related to mobile phone network connectivity noted from the thematic and numerical data. This led to the theme of digital divide as poor connectivity meant that the community did not always have full access to their mobile phones. Poor network connectivity was reported as a major hurdle in the use of mobile phones and the Internet. Of the 345 surveyed participants,

the network affected 28, who resolved to have another SIM card (see Table 6.3). There were problems in accessing full network coverage of the mobile phone service providers. The network that is most accessible is Vodacom. Vodacom network works well most of the time, except during bad weather conditions. It was reported that when there are heavy rains, the network becomes inaccessible. When this happens the power also goes off, leaving the community without electricity or network coverage. On such a rainy day, the network may be down for a couple of hours or a maximum of two days. Those coming from other places and employed in Phake reported that they struggled with a signal when at work. It was reported that the Vodacom network coverage was good in the Phake area while the MTN coverage was good in Pankop, owing to the availability of network terminals in those areas. This is what Peggy, one of the respondents had to say:

“We also have difficulties in surfing the Internet due to poor network coverage”.

Reasons for additional SIMs	Total response of the 345
Multiple SIMs	30
<i>Connectivity</i>	26
<i>Contract SIM</i>	2
<i>Leverage benefits</i>	14

Table 6.3: Multiple SIM usage

Source: Own

The respondents also reported that the network connectivity and the electricity outages are linked. This is because the electricity and the network coverage go off concurrently when the weather conditions are bad. This is what they said:

“Yes it can go for two days. It goes off with electricity” (Lee).

“The Vodacom network coverage is sometimes lost when there is a power outage” (Mary).

The digital divide theme was based on both the thematic and numerical data. There was a low response from the survey, showing that the community does not focus on the challenges related to the device. The trend of multiple SIMs was posed in the survey to confirm connectivity issues, but the small number suggests that the community is subscribed to an MNO that is easily accessible.

6.3.2 Community Policing Forum (CPF)

The community policing forum (CPF) helps the community to deal with violence, crime and other issues that disturb peace in the community. It is the first point of contact when community members encounter crime-related problems. The CPF comprises community members who have interest in contributing towards a community that is safe and in harmony. They are nominated and elected in community meetings as part of the subcommittees of the community leadership. Here are some of the motivations they provided on why they are part of the CPF:

“I realised that crime was too much and the police cannot handle everything on their own so as a community we have to be involved” (Levy).

“I was elected to the role. If you turn down the nomination, you wonder who will solve the community’s problems. By doing this, I think our community will be a better place. We help each other to resolve issues and maintain peace”. Winnie.

“To assist people when they are fighting and to rebuild families in cases of feuds” (Ria).

The CPF is regarded as the important complaint forum. Therefore, both Phake Rebone and Rebone Extension have their own CPFs to attend to each community’s issues. The two entities work independently and only collaborate when they have issues that involve members of both communities. Each CPF has its own leadership, which together with other CPF members deal with issues of domestic problems, neighbourly problems and crime issues. Both groups were interviewed. Phake Rebone has four members and due to availability, only two members were interviewed from this group. The Rebone extension has three members and two were interviewed due to availability. The two groups cater for different targets and the type of problems they

deal with tend to differ. The Phake Rebone Extension CPF is younger and it cannot deal with some domestic problems owing to age gaps between it and the complainants. The Phake Rebone CPF comprises elders and can therefore resolve most of the domestic issues reported. Following are some of the challenges that the Phake Rebone Extension CPF encounters:

“Heavy issues such as rape and family problems are referred to the police. Sometimes we deal with complaints from the elderly members of the community and such matters are also referred to the police as we are young and cannot command our seniors” (Winnie).

The quantitative findings revealed that there was interest from the community’s side to use the device to contact the CPF when needed. As stipulated by the Phake Rebone community that they do not prefer to receive complaints over the mobile phone, the 40 per cent in Figure 6.2 confirms the thematic data. The 32 per cent who regularly call the CPF when troubled represents the Phake Rebone Extension qualitative results. The remaining 27 per cent reflects the moment where, even if it is not desirable to make a call, the urgency of the situation makes them to so.



Figure 6.2: Calling CPF for help

Source Own

The arising theme from the above findings is safety, the recurring theme that emphasises the community's collectiveness and caring. The Phake Rebone Extension CPF does work together with Phake Rebone CPF on certain issues. When the complaints are between the two residences, the teams work together to amicably solve the problems raised. The CPF team mentioned that the police are an integral part of their group. The CPF involves the police on criminal issues and in arguments that they feel are beyond their control. They also work with social workers for domestic issues that require professional intervention. The police also assist with logistics and grooming the teams.

“They help us with transport when we go to meetings or workshops. They also help us with the constitution to guide every member on how to do things,” said (Levy).

The varying distribution of the numeric data on the likelihood of using the mobile phone to report issues with the CPF helped inform the safety theme. Both the thematic and numerical reports on the need of safety support the different ways of achieving that. The expressed preferred modes were both in person and mobile phone reporting.

6.3.3 Community leadership

The community leadership is an integral group of the community as it provides leadership for Phake Rebone. The purpose of involving this group was to see the extent to which it uses mobile phones to contact the wider community that it is serving. Community members are well represented in the community leadership because it includes both youth and older people of both genders. As was stipulated in Chapter Four, the representation is mainly from the ANC. The leadership is responsible for providing direction within the community, as well as initiating and supporting different community projects. The leadership comprises those who were representing the community at the municipal level, residence committee and the ANC leadership. The municipal representation focuses on service delivery issues. The residential committee looks at various community needs. It is this committee that has also established the street committees.

“As a chairperson of ANC women's league. I encourage people to be part of the ANC because we used to live in times of hardships under the apartheid regime. We could not move freely. We only had 24 hours permit for our work and if your permit expired you would be arrested. In school we were taught English for an hour and learned Afrikaans most of the time. The good thing though is that we were given good food in school...I empower women and encourage them to enter into positions of leadership. I also look at the interest of the community like assisting them with issues of housing, water and stands” (Thoko).

“I think I am a natural leader. As a matriculate I decided to be active in politics. I have an interest in a political career. I have been nominated in positions of leadership since I was in school...The way youth is carrying itself, I chose this path to be an inspiration to them through leadership. I am not impressed with their indulgence in in unsafe sex, drugs, and alcohol” (Sello).

Subcommittees are also established to provide additional support on the issues facing the community. For instance, the residential committee sometimes works with the CPF to resolve certain issues. According to (Joe), the small projects' committee was established to manage and oversee the projects that are done in community. This committee also manages “diphiri” which is responsible for taking care of the graveyard.

“There are people that I am working with in each and every street. When we have project the street representatives collect the money and they bring it to me. I manage these collections. This process is efficient because it helps with accountability” (Joe, the community treasurer).

“As the secretary of residents committee, I take minutes and assist community members with their issues. I also support the youth by empowering them. I saw the need to assist community with the skills and knowledge that I have” (Rebecca).

The ANC leadership is responsible for taking care of political activities and programmes. One of the initiatives done by the local political branch is the children's

forum. The children's forum focuses on how children are treated in their homes and whether they are receiving good care. It also looks at the availability of uniforms for school-going children. When it discovers any problems that affect the well-being of children, it escalates the issues to the social workers (Hopolang). The livelihood theme is repeating itself on the leadership level, highlighting its importance in this community.

The results here are only thematic and express the roles that the community leaders have for their community and reiterates the livelihood theme. There is no numerical data as the survey questions were not related to the leadership. What was noted was that issues that are related to them are mostly reported by the mobile phone. This confirms the relevance of the mobile phone in reporting issues as was observed in the section 6.3.2. It further reiterates a theme of safety.

6.3.4 Learners

The learners were included in the study not only because they are part of the community, but also to understand their interactions and views regarding mobile phones and learning. They are the generation that was introduced to the mobile phone and related technologies at an earlier age. Therefore, their inputs would have a tremendous impact in the study. The learners reached by this study included the ones studying in Refitlhile, Phake Primary, Mapala Middle School and Mabothe Secondary School. The learners were mostly in their teens with only a few in the primary phase. Most learners of the younger group were away on vacation as it was school holidays and only 13 were interviewed. All the schools were represented with Refitlhile, Mapala, and Mabothe, having three, four and six learners respectively. When the learners were asked about their career paths, they showed interest in furthering their studies. The table below shows their career interests. The medical career was preferred, followed by teaching and serving the country as soldiers. The career aspirations confirm that they are aware of the need to improve their quality of lives and improve the livelihoods of their community.

Career paths	Number of respondents
Teacher	2
Soldier	2
Driver	1
Accountant	1
Receptionist	1
Animator	1
Radiographer	1
Doctor	3
Social worker	1

Table 6.4: Learner career aspirations

Source: Own

6.3.5 Educators

The educators were included in this study to gain an understanding of their perceptions and usage of mobile phones, particularly in classrooms. The use of ICTs has evolved such that they are part of the classroom environment. This study wanted to find out the effect these phones in these rural classrooms. The educators interviewed were not those teaching in Refitlhile Primary School as initially planned. There was no interest to participate from Refitlhile; as a result, the researcher only interviewed the principal there. The two other educators who were interviewed were residing in the community. The first one was formerly employed in Refitlhile and later found another teaching position in a nearby village. The other educator was teaching in Phake Thabeng that also serves the Rebone Extension community.

The resources used to educate learners are those supplied by the Department of Education and the additional ones that are brought by learners from their home. The materials include textbooks, basic teaching aids, concrete objects, newspapers, magazine clips and other materials that teachers develop based on the curriculum requirements. The ICT infrastructure in the school was computers only. However, the educators were not using them for teaching. The reason behind this was that the curriculum is not designed to fit computers. Educators felt that the curriculum is prescriptive and demanding, which made it difficult for them to incorporate computers

into their work schedule. The school has therefore introduced computer literacy as an additional subject to introduce learners to the use of computers. During this period, learners are taken to the computer laboratory in groups to learn basic usage of the computer. They are taught operations such as typing, saving, accessing and printing documents, as well as saving information on portable storage devices.

The Department of Basic Education (DBE) also provides the school with some content programmes although not relevant to the curriculum. According to (Mark), they have a mathematics programme that introduces foundation learners to the basics of mathematics. “However, the challenge is that we do not have it as a form of material because it is not part of the curriculum” says (Mark). The computer lab is also used as a classroom because of the overcrowding issues facing the school, as indicated in section 6.3.1 (see Figure 6.3). Lack of access to the Internet in the school also limits educators from using these computers to conduct their research; therefore, they have to rely on mobile devices. Mark further reported that the lack of follow-ups from DBE on the computers that they provided is a challenge. This means that there was no monitoring and support provided with regard to the usage of computers. The principal decided to offer peer training due to the lack of educators’ computer skills. However, Mark reports that the interest to attend this training is quite low. Lack of interaction with such ICT devices creates a technology gap between learners and educators because the learners make time to use the computers. This reflects another level of the digital divide theme whereby the lack of ‘know-how’ of some ICTs extends the digital gap. The following expression is what Mark had to say about the educator-learner gap in ICTs:

“The technology gap between us and learners is huge, so we are delaying them. We need to be skilled. Learners are very good with mobile phones. There are applications that they understand better than us; those include ‘WeChat’ and the Internet. Learners force us to take them to the computer lab. If it was possible, we would use ICTs as a teaching medium, but most teachers are not ICT literate.”

The educators showed interest in using other applications that can support learning. ICTs are viewed as tools that make learning more enjoyable and adored by learners.

It is believed that other forms of delivery would be great for learners. One educator articulated that they are teaching “space age kids” who are easily bored by educators’ paging through books. The Internet was also referred to as being quite important in accessing information and assisting them to better understand some content. Access to information was regarded as easier and quicker through the Internet. Furthermore, the information on the Internet is more recent compared to that of books, which enables access to relevant information.

When asked about opportunities to increase their knowledge, the educators said they have access to training opportunities. They attend workshops provided by the department to improve their knowledge. Others enrol for further education through the support of the DBE. The Internet was also cited as one of the means of staying abreast of new educational developments. Internet is a tool for self-development, adding to the themes of our research namely empowerment and training (arising from further education).



Figure 6.3: Refitlhile Primary school's computer lab

Source: Own

6.3.6 Health workers

Each community has health needs, they are offered by different health facilities. In Phake Rebone, the Phake Clinic does that. The health workers in the clinic take care of the community's health needs. As part of the community, health workers were interviewed to attain their perspectives of the use of mobile phones. More importantly, how they interact with mobile phones in terms of communicating with patients. In Phake Clinic, the interviewed sample consisted of five women with two different teams. The team of three women constituted professional nurses based at the clinic. The other team was composed of two women working as HIV/AIDs carers who were from the Phake Home-Based Care (PHBC), which works closely with the Phake Clinic. The nurses' roles are mainly to do consultations with patients, conducting health education, dispensing medications, immunisations, vitals, counselling and family planning. The PHBC team provides support to people living with HIV/AIDs within the Phake area. The job of this health team reiterates the livelihood theme observed from other groups. The uptake of ICTs was evident in the clinic. The ICTs used in the clinic include fixed telephone lines, mobile phones and computers. The nurses are, however, not directly using the computers because the clerks enter their file details into the computers. This is what Carol, a nurse, said regarding the use of ICTs:

“We use the telephone to follow up with patients and the hospital for any problems relating to patient transfers. We use the computer indirectly through the clerks who capture our files' data into the system”.

PHBC is also equipped with computers although these are not used. It does not have a fixed telephone line and the employees use their mobile phones for work purposes. The administrative staff said that they do not know how to use computers. The head of this establishment was attending computer classes and had plans to share the acquired skills with her staff once she is confident with her computer skills. This is what she had to say about computers:

“We have computers, but I do not use them because I do not know how to use them. I still need to learn,” said (Marie).

The teams do take courses and workshops to expand their knowledge. They mostly attend courses and workshops that are organised by the Department of Health. The nurses also conduct “in-service training” (Winnie) which allows them to share their knowledge with their peers while at the same time learning from them. The patients are given the opportunity to attend health talks with the nurses at the clinic (Winnie), which serves as an educational programme that benefits the community. The PHBC team, however, does not enjoy the full benefits of these training opportunities because they are subject to budget availability. Empowerment and training are other recurring themes evident in the health groups as well. However, only the manager and the coordinator get to attend the training, other volunteers are not catered for in these training activities. If training was widely available, the volunteers would also have the opportunity of expanding their skills levels so that they can be certified. Certification would increase their employability status and inspire other community members to volunteer, not only to help the community but also to empower themselves with various skills.

“We do go to workshops which are organised by the department of health and social development” (Agang).

The two health groups represent those who care about the wellbeing of the community. The thematic data show the clinic and home based care contributes towards the livelihood theme and further shows the limited resources and skills that even those who are employed lack. For example, the availability of computers does prove that having certain ICTs does not necessarily mean they will be used. The empowerment was also identified based on available and required training.

6.3.7 Local business

Local businesses are instrumental in enabling the communities to access some of the necessities without traveling to the cities. They form an important part of any community and highlight the livelihood theme. As a result, they were included in the study so as to understand the extent to which they use mobile phones in their businesses. The business owners interviewed were locals of Phake Rebone and Phola Park that also serves the Rebone community. It was two retailers who were selling food and a transport service that was transporting kindergarten children. About

five retail business establishments in the community are run by the Pakistani and Somalian nationalities. This group was not interviewed owing to language barriers. The interviewed business owners were operating their businesses on their own and had no other employees. They were not formally registered because they did not have information on how to go about registering their businesses. The two retailers had challenges with regard to creditors who were not paying on time or not paying at all.

“My main challenge is giving credit to people who do not pay back” (Fridah).

The transport service business had problems with the traffic police, who, according to (Peter), stopped him all the time when on duty. He also complained about the parents who were not preparing their children on time. Servicing his vehicle was also reported as a problem due to the area not having skilled mechanics.

Survivalist businesses were also noted in the community. These were individuals who were trading some goods only for survival purposes. The qualitative data brought up 12 survivalist businesses (see Tables 6.2 and 6.3), the owners were either still looking for a job or depended on disability grants as another means of survival. They were actively looking for employment opportunities. Other entrepreneurs who used to run businesses had lost their businesses to the Pakistanis and Somalis. These entrepreneurs complained of unfair competition, which finally led to their businesses not surviving. It was reported that these competitors lower their prices to a point where the local traders cannot even match their price and the locals eventually lose the business to them. This is what Andy, an unemployed former business owner, had to say:

“I closed my tuck shop because of unfair competition from the Pakistani people that are doing businesses here. It is difficult to report them for the unfair practices because of being in a rural community. We do not know of where to report this. There is also no support from my community as they opted to buy from the Pakistanis”.

The qualitative and quantitative data identified issues of limited skills in running the businesses by both those who are trading full time and survivalists. This echoes an

empowerment theme, where the business minded can persevere and conduct sustainable businesses. The livelihoods theme is also emphasised by these business's vision of enabling everyone to buy groceries closer to home.

6.3.8 Summary of main themes

The findings of the study reveal both the challenges faced by the community and how the different role players work together to keep the community functional. This summary reflects back on the overview (section 6.2) and how the findings (section 6.3) ties into the different themes. The livelihood theme showed how unemployment and limited infrastructure affects the quality of life in the community of Phake Rebone. Nevertheless, the community was focusing on other initiatives that contribute towards a positive livelihood. For instance, they were working together to resolve disputes, mourn and bury loved ones, share information in social gatherings through the CPF and community leadership initiatives. The community leadership team also ensured that the destitute and vulnerable children had social intervention programmes to support them. The learners group showed intentions of changing their community's livelihood by furthering their studies and have a career. The educators were also contributing to the livelihoods of the community by educating its future leaders and adults. Ensuring a well-cared and healthy community is important and this was evident in the efforts of the health workers.

Factors influencing digital divide determine who will reap the benefits of mobile phones even in this community. Access to MNOs services was interrupted due to poor network infrastructure thereby causing a divide in terms of using the mobile and related services. Users are disadvantaged based on the MNO that they use as the network signal is limited for those not using the Vodacom network. This digital theme was also evident in the education group where it was cited the learners are more advanced with the usage of the mobile phone compared to their educators. Thus echoing a social digital divide influenced by age differences and confidence in using mobile phones.

A theme on safety came out strong in the CPF group where the members had volunteered their time to help create a community that can live in peace and reconcile their differences. Their efforts were supported by the community leadership team which also handled some safety related issues with their subcommittees.

Empowerment as a theme that would bring about change in the community's livelihood was noted in a number of groups who needed to expand their knowledge. This was evident in the learner group that wanted to further their studies and have a better future. Educators also expressed a need to be empowered with digital literacy and some were involved in further learning to gain more knowledge. The health group required ICT training to be able to use available resources such as PCs and mobile phones and to further use them for health education given to patients. Although the business group was not aware of this need, empowerment is needed to help them realise how important their services are in building the wellbeing of this community. The fact that others did not regard themselves as important in the economic realm compared to those who were employed elsewhere shows that they do not know the value of being self-employed.

Similarly to empowerment, training was another theme that the community needed. The community group, educators and health workers wanted to be trained on how to use the mobile phone effectively. The next section presents the mobile phone usage findings.

6.4 MOBILE PHONE USAGE

The mobile phone is widely used by the community, both young and old, to serve basic needs of communication. All the community members own a mobile phone, except the younger ones who use their family members' mobile phones. Only two in 345 respondents did not own a mobile phone, but were using one. The ownership of a standard mobile phone was slightly lower compared to the smartphone. The standard phone was owned by 30 per cent of the users, feature phones had 31 per cent ownership and the smartphones were higher with 39 per cent (see Figure 6.4). This shows the growth of the smartphones in this community. There were four respondents who owned more than one mobile phone. In such cases, one would find that it is a combination of either a standard or feature phone with a smartphone as a second device. This trend may explain the lower percentage of the use of standard phones, meaning that the people are slowly advancing to smartphone devices. Usage of these devices differed from age group, the type of mobile phone used and the level of

education. One of the respondents said this to express her fascination with mobile phones:

“Nowadays, discussions and arguments are more fun with recent technologies because anything that we are not sure of, we can google it. Unlike back in the days” (Tryphina).

Respondents who owned a standard mobile phone used it for making calls and sending messages. There was also a group that used the basic mobile phone for playing games. Those with feature and smartphones used them for basic communication, chatting on social networks and downloading games. The dominant theme in terms of usage is communication, meaning that the device is primarily used for this purpose.

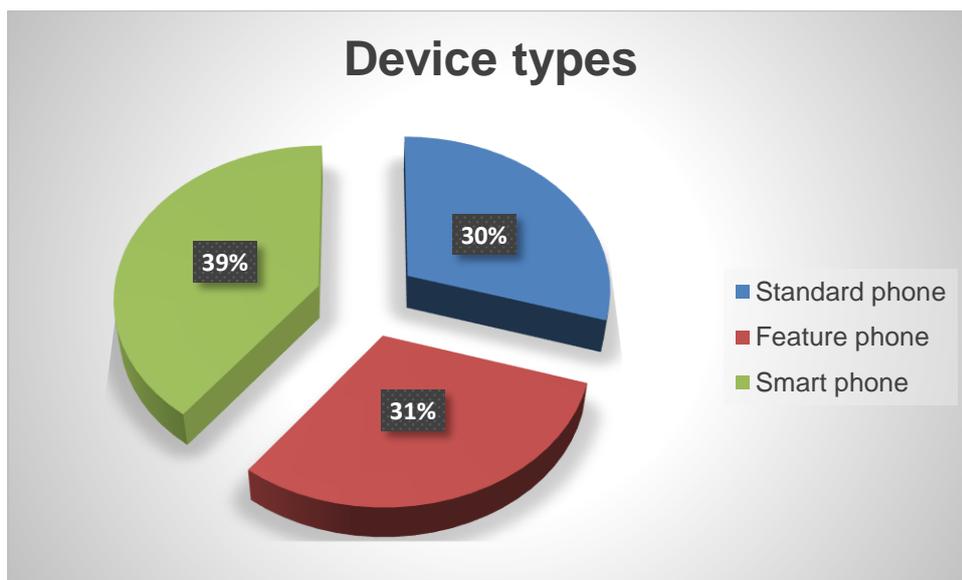


Figure 6.4: Type of devices

Source: Own

6.4.1 Access to mobile phones

The topic of access focuses on the ownership and usage of mobile phones. As indicated in section 6.4 that the community has a large number with access to the device, the only distinction noticed was ownership. The ownership rate was lower among the younger group of the study. The qualitative data showed that among the learner group, five in 13 learners did not have a mobile phone and one had previously

owned the device. In the adult community group, only one in 16 people did not have a mobile phone and they had previously owned it. In the health workers' group all five respondents had a mobile phone and one was using a borrowed device, as she "could not live without a mobile phone". She also had plans of buying it in the very near future. The findings showed that the adult population has owned a mobile phone for at least over 15 years, with the younger ones varying from less than a year to maximum of two years on average. The prevalence of the Nokia devices was also noted as the brand of choice within the community with 57 per cent of the participants using it. Samsung took fourth position as the main competitor of Nokia with 25 per cent penetration. The ZTE and Blackberry were some of the brands used with five and four per cent, respectively. The LG and Vodafone devices both had two per cent usage. Other general devices used had a share of five per cent, comprised of different brands, where new brands such as Donod leading common brands such as HTC.

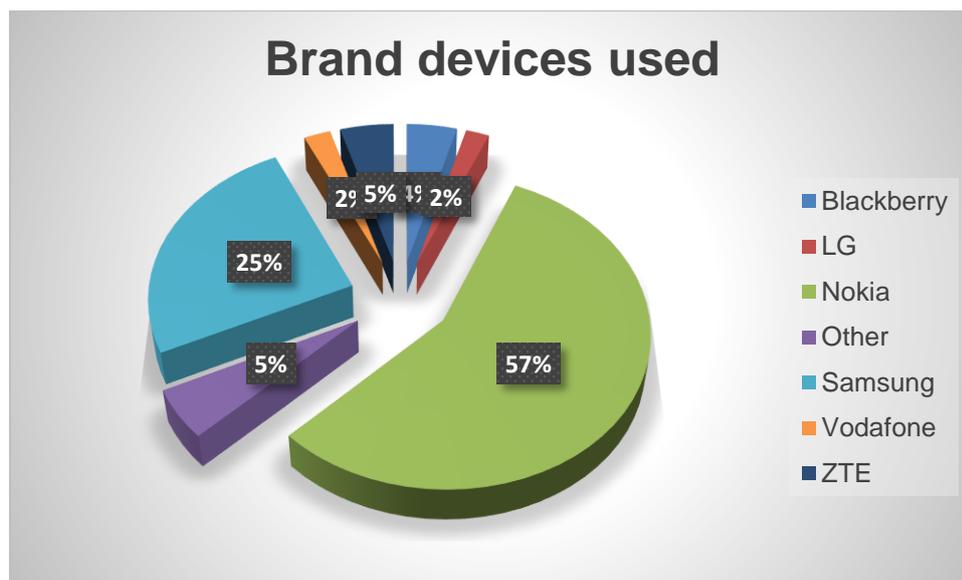


Figure 6.5: Brand devices used

Source: Own

The use of multiple SIM cards was noted during the qualitative data collection process. The survey recorded that 30 users had multiple SIM cards. Of the 30 users, 62 per cent owned multiple SIM cards due to network coverage problems. As illustrated in Figure 6.6, 33 per cent had additional SIMs to benefit from the mobile network operators' (MNOs) promotions and discounted calls for similar service providers. Edmond said this:

“I have two SIM cards, Vodacom and Cell C. Vodacom has many promotions; it accommodates us who are not working or are less fortunate. I use the other one (referring to Cell C) to access the Internet because it is cheaper.”

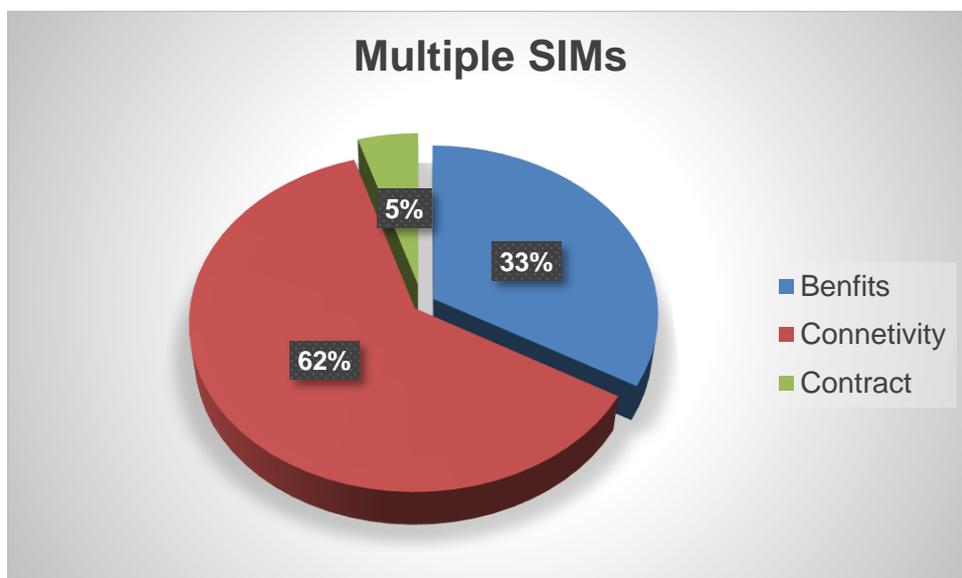


Figure 6.6: Multiple SIMs usage

Source: Own

The network connectivity was reported to be poor for Vodacom when the weather conditions are bad. During rainy and stormy periods, connectivity is lost and this lasts for a minimum of an hour to a maximum of 24 hours. The MTN and Cell C networks were reported as having weak signals, though the users with only one SIM card were still managing. The people coming to Phake for work purposes reported that they were struggling with the network of other service providers. They shared that this could be because in the Phake area there is only one network terminal belonging to Vodacom. The health workers who travel between Phake and Pankop reported that when they are in Pankop, the MTN signal is good and when they are in Phake, the Vodacom signal tends to be the good one.

“I have two SIM cards, Vodacom and MTN. There are people who are using MTN at home so I use it when calling them to save on airtime. The other reason is that sometimes the Vodacom network is poor” (Mary).

Cases of users owning multiple SIMs of the same service provider to increase their benefits were also observed. This is what Tom said about his use of SIM cards:

“I have four SIM cards, one Cell C, one MTN and two Vodacom. This is for me to benefit on their promotions. When there are network issues people can reach me on the one that does not have problems. All the numbers are only given to those who may need to contact me urgently. The two Vodacom SIM cards are for the advance benefit and when I cannot pay the loaned airtime, I can loan or recharge the other SIM.”

The number of SIM cards per user group was different. There was more usage of multiple SIM cards in the community leadership group than in any other group. Of the seven members interviewed, three had more than one SIM card. The CPF members had the majority of members using one SIM card, with only one member having more than one SIM card. The users in the health workers group only used one SIM card. The educator group had only one participant using one SIM card. The observed usage of more than one SIM card was prominent among those who are employed and are between ages of 21 and 50 years. They are more aware of the benefits across the MNOs and some are subscribed to contractual mobile phones.

The thematic data highlighted a trend of locational SIM cards was also noticed. This refers to those that use different SIM cards when in different locations. In the case of this community, those who are not living there permanently use different SIM cards. For example, the SIM card whose network coverage was good would be used in Phake and when in other areas then the users switch to a different SIM card. The notion to use more than one SIM card either to curb connectivity issues or to maximise benefits portrays the users' ability to adapt new forms of how the device can work for them. They are therefore creating means of how the mobile phone can service them, not the other way around as was projected by different MNOs. This shows the sense of freedom that they have through the device that adds to the themes of the study. The adaption of usage is therefore created as a sub-theme under the theme freedom for further discussion.

6.4.2 Usage

This section presents the various reasons for which mobile phones are used in the studied community. The main reasons observed were those of communication, searching for employment opportunities, research and entertainment. Communication will be divided into general voice and SMS, followed by other messaging services such as chatting and social networking. The results will be analysed based on the different groups, depending on which one a particular group used.

6.4.2.1 Communication

Communication was highlighted as the most important reason for using mobile phones in both the thematic and numeric data. The fact that there is no access to the fixed telephone lines in this area makes mobile phones more appreciated. The usage of social networks and chatting platforms was noted, particularly for those owning feature and smartphone devices. Some of those who were not on social networks were aware of the fact that chatting platforms are cheaper than sending SMSs or making calls. There was a noticeable change of technology, particularly in mobile phone technology by some respondents. The respondents gave an example of the evolution from a Nokia device known as “3210” to “5210”. With this evolution, the user indicated that she had advanced from sending SMSs only to using Facebook and WhatsApp to communicate with people. She further expressed that there may be improvements in the future, whereby in 2020 there may be different devices other than mobile ones that will be used for communication. Abraham, for example, mentioned that before owning a mobile phone, he could not access the Internet and social networks, now he can. He also mentioned that he could not communicate with people when he needed to owing to distance and lack of easy communication channels.

“When I send one please call me back it means I am greeting that person...”
(Kamo).

“I can communicate with the people whom I know, especially those have their own businesses. I WhatsApp them and I sometimes call them depending on how much airtime I have in my phone” (Lena).

Calls, SMS and please call me back services (PCMBs) were used as a mode of communication. The PCMBs was used more than the SMS to send messages to family and friends. The electronic mail (email) is another form of communication that is widely used. However, its usage in this community was next to non-existent. The qualitative account revealed that those who were using it were those that who some form of employment: their employers may have introduced them to the email application. This was less prominent in the health and education sector, where most communication was done *via* voice calls.

The upcoming discussions are on how the educators, CPF, community leadership, health workers and business groups used the device for communication. The learner group is not included as there were not much communication activities from them besides receiving calls from parents.

6.4.2.1.1 Educators

The educators relied on mobile phones for all their communication. One of the respondents was able to stay in touch with the DBE as the school did not have a fixed telephone line. All the correspondence with DBE was done through the mobile phone. Others used it for supporting their learning process at institutions of higher education. They used the device to communicate with the institutions at which they were enrolled. Below are the remarks from the educators:

“Our area does not have a land line so I use it to communicate with the department” (Mark).

“I take pictures of assignments for self-advancement courses and submit to the college” (Timmy).

6.4.2.1.2 CPF

It was discovered that the urgency of the issues that the CPFs are dealing with does not allow them to use mobile phones as tools for reporting matters. The teams use the mobile phones to inform each other when they need to report somewhere for a matter that has risen. According to Josephine, community members come in person to report their problems and the CPF members contact each other using mobile phones. She

sometimes walks to other members to report the matter that needs to be addressed. The mobile phone therefore only serves a small role in terms of reporting the arising matters. The CPFs do, however, use the device to contact the police in criminal cases and matters that cannot be resolved amicably between the team and the complainants. The survey responses showed that 32 per cent of the community members were using mobile phones to contact the CPF. This could be in situations where they could not go in person to the CPF members. The Rebone Extension CPF team was more flexible in receiving complaints through mobile phones; therefore, the presence of this mode of reporting may have been coming from those residing there. Moreover, in domestic and other criminal altercations, the mobile phone was the best tool to reach people for help. Figure 6.2 in section 6.3.2 shows that at least 32 per cent of the community members surveyed used it to contact the CPF.

6.4.2.1.3 Health workers

This group for personal and work purposes used mobile phones. The clinic staff used these mainly for personal reasons and the PHBC used them for work purposes. The nurses also used mobile phones to reach the colleagues who are off duty whenever they needed their assistance. Although these were not used to make business calls, mobile phones enabled the staff on duty to reach those who are off duty because they all do not have fixed telephone lines at home. This group did not use social networks and messaging platforms. They owned mobile phones that are compatible with the applications but they were not using them. This was because of their ages and lack of knowledge on how to operate such applications.

6.4.2.1.4 Business group

The business group reported that they were using mobile phones for business purposes. These were used to call suppliers to order stock and to get information for their businesses. The group was not aware of other ICTs that they could use for their businesses. Only one respondent was aware that ICTs are important for accessing information. This was the same respondent who was using her mobile phone to search for information. The use of mobile phones to support and promote the business was not practiced by most of the businesses. The only feature used was the call but for minor activities. The SMS feature was used slackly for advertising their services and products.

6.4.2.1.5 Community leadership

The community leadership team used mobile phones mostly to call each other for office-related matters and arranging meetings. Besides that, other applications were not used much for work-related matters. The interaction on social networks was only on a personal level for those who had access to the applications. With the elections that were approaching, it was expected for this group to use mobile phones to campaign. However, mobile phones were not seen as the best tools to send their messages across. They were, however, cited to have assisted in encouraging people to register for the elections. When the team realised that the turnout was lower than expected, they sent SMSs to community members encouraging them to register. The SMSs turned out to be a success because more people went to register. Those involved in leadership expressed the preference of campaigning and lobbying in person rather than over mobile phones. One member said, “it is not safe to lobby via the phone” (Piet). The leadership had strong resistance towards using mobile phones for campaign purposes. They said they prefer the personal door-to-door strategy as it enables them to answer any questions or clarify any other matters better than using other communication channels.

“We are foot soldiers we do door-to-door. Using a cell phone is a sign of cowardice. You become biased,” said Jerry.

The lobbying of positions was also seen as something that could not be done through mobile phones for safety purposes. There was a general feeling of letting the structure decide on the best person for the particular post. It is believed that the person’s dedication to their duties is good enough for both the community and the leadership to make the right choice. The sub-themes arising from the communication theme was voice calls, messaging and social networks.

6.4.2.2 Employment

Others used the mobile phone for employment purposes, contributing to the livelihood theme. It was used to search for employment and help the employed to do their work efficiently. A total of 60 respondents used mobile phones to enquire about employment opportunities. Figure 6.7 illustrates the different methods used. The devices were also used to search for employment opportunities on the Internet; those who used it

“always” were 28 and ‘sometimes’ 46 in number or gave out their numbers to prospective employers so that they can be contacted easily. Mobile phones were used to send applications and other required supporting documents. Others receive calls from family and friends when there are job opportunities. Mobile phones were also used to call and enquire on the advertised positions.

“I write my numbers on a CV and I also give people my numbers for in case something comes up they can contact me” (Mosa).

“I can Google available posts and sending documents through an email via my mobile phone” (Cate).

For those who were employed, mobile phones assisted them to carry out their duties, such as obtaining directions of where their clients are while travelling there. Employees also received instructions through mobile phones to ensure quality work. The health workers could communicate and get hold of colleagues quite easily using mobile phones. For the clinic, it was also helpful in contacting those on leave to come and assist when short staffed or some crucial information is required from them. Patients can also be easily reached without wasting their time and travel costs for important updates. The educators also used it as their main communication device with the DBE. Any work matters were relayed through mobile phones.

“When we are short staffed I use it to communicate with others. When we do not have certain medications we call patients to inform them. For example, when there is no immunisation tools we call the patients to tell them when they will be available” (Cathy).

“It helps with administration because the department needs to contact me directly” (Mark).

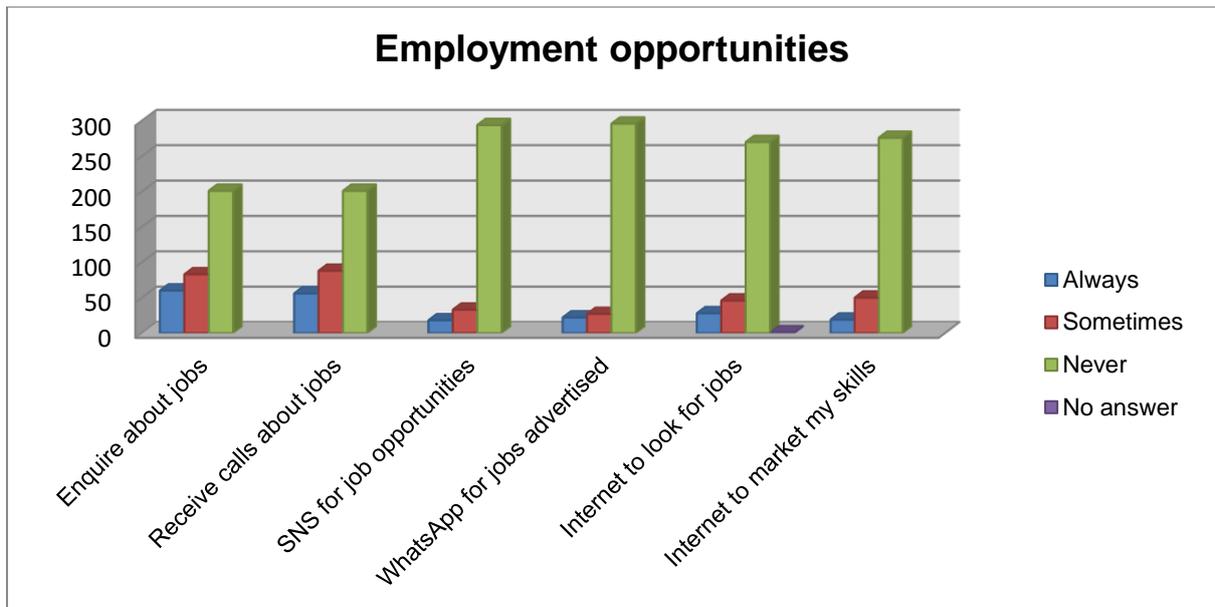


Figure 6.7: Seeking employment via mobile phones

Source: Own

The use of the mobile phone and its related applications was not used optimally for seeking employment. The quantitative results are not convincing since the unemployment is quite high. This will be elaborated further in the next chapter.

6.4.2.3 Learning and research

The learning and research topic contributes towards the empowerment theme, making it a sub-theme. One learner when asked if she thought it would be worthwhile if teachers were to use mobile phones to facilitate some lessons, she expressed that there was no need as they are old and know everything. In the perspective of this Grade three learner, whatever value mobile phones could bring in the classroom, the teacher should have it. What this could mean is that perhaps instead of physically using mobile phones in the classroom it would be better if the teacher learned from them and then shared the information in his/her own capacity. The possibility of disruption of the learning process was noted, whereby it could come from the learner or educator. The educators appreciated mobile phones for giving them an opportunity to conduct research prior to their lessons. They used them to better understand words and concepts through the Internet.

“If you do not know the meaning of a word, you can just google the word while in class” said (Paul).

“It is beneficial for doing research before our lesson presentations,” said (Mark).

“I mostly google to know about other news happening in in other places. Updates of the country as a whole like entertainment and sports” (Leeto).

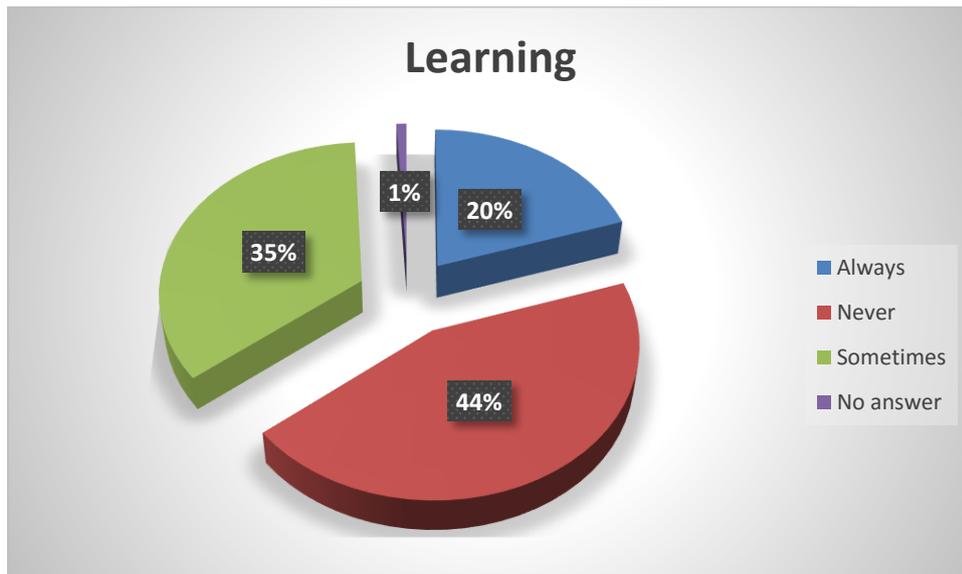


Figure 6.8: Learning with mobile phones

Source: Own

When asked if they may consider using mobile phones to facilitate lessons, the educators showed interest. They reported that this would help learners to have interest in lessons, particularly where the Internet can be accessed to show them additional information online. It was also reported that this would decrease boredom in classrooms. One of the educators was, however, against the idea. He felt that using mobile phones to facilitate lessons might cause disruptions in the classrooms. A similar sentiment was raised by some learners. The quantitative data revealed a limited usage for homework purposes. Only 11 per cent used it often, 20 per cent used it sometimes. A large 65 per cent were not using it at all.

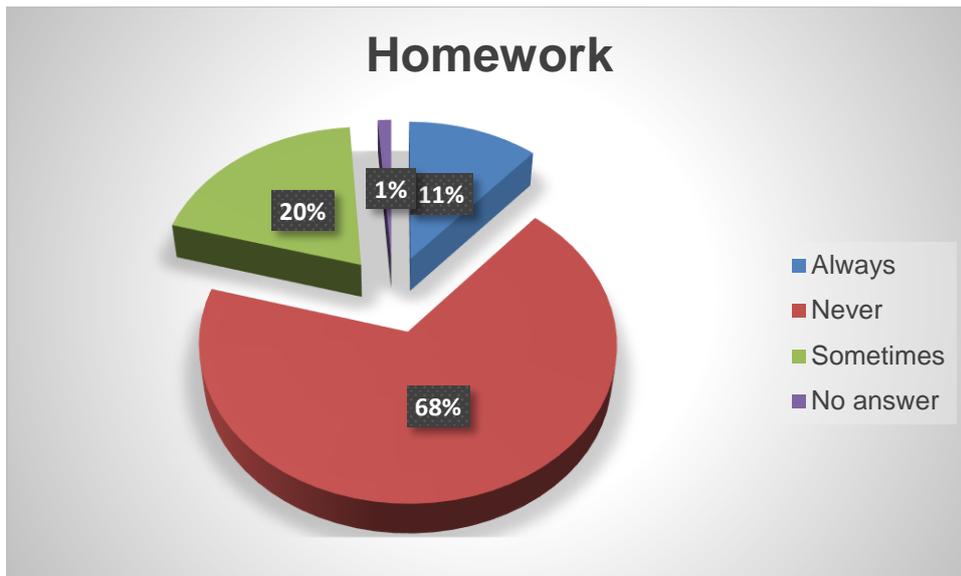


Figure 6.9: Homework on the mobile phone

Source: Own

The numerical data illustrates that mobile phone was used more for learning and research on other matters other than learners' homework. These results did not confirm the thematic data that suggested that it was used to help learners with homework. This shows that learners are not using the device to help themselves with schoolwork.

6.4.2.4 Banking

Banking was addressed in this study to understand if mobile banking was known in this community. The community was asked if they knew about it and if they had access to mobile banking. Another important question raised was whether they would use it or continue to use it in the future. An interest in the use of mobile banking was also observed from both the qualitative and quantitative results. The community members were citing it to be time and cost efficient. Conducting their banking at home reduced the need to travel to banks and therefore saving them travelling costs. As illustrated in Figure 6.16, section 6.4.3.4, seven per cent of the community were using mobile banking regularly whilst 13 per cent used it sporadically. Banking was therefore identified as a sub-theme for livelihoods.

“Yes, I learned about it (mobile banking) from the brochures that we get from the banks” (Leeto).

“Yes. I do things sitting at home unlike before where I had to go to the bank for a piece of paper (bank statement); I can buy electricity and airtime” (Nonny).

“Yes I will consider using mobile banking in future because we are using pre-paid electricity therefore we can buy and airtime anytime we need them” (Emily).

“No I do not know about mobile banking; I only know its advertisements” (Mpule)”

For the participants who had access to mobile banking, they mainly used it for buying airtime, checking their account balance, checking bank statements and buying pre-paid electricity. Even those who were not using mobile banking knew its importance and efficiency.

In section 6.4.3.4, the question of continued and future usage is addressed. The noted low usage of mobile banking is linked with low employment rates as was noted in section 6.3. The next section discusses various uses of mobile phones by age, and the key groups of this study.

6.4.3 Usage by age

The usage of mobile phones will be discussed based on three different groups. The first group entails young ones between the ages of seven and 40 years. This is the group that is exposed to mobile phones and use it for different reasons. The second group entails users between the ages of 41 and more than 60 years. They were mostly introduced to the device later in their lives. Both groups interact a great deal with these devices although they are used for different reasons. The main aspect is communication, be it on voice calls only or using the messaging platforms. The qualitative findings of this research showed that in most cases they engage in games and sometimes search the Internet for school homework. Gaming and using the Internet for homework and learning was also noted on the second group. The first group had an understanding of mobile phones and it was noted that the emergency element that is enhanced by these devices was well understood. The safety theme is observed, only this time on how it is carried out by the mobile phone. This was

influenced by the information shared in school regarding safety and the need to know the emergency contact details. The younger ones' appreciation of the devices was based mainly on making emergency calls, playing games and accessing information by surfing the Internet. They used the Internet to assist with research for homework. The recurring learning and research sub-theme was observed. Following are the examples how the younger ones used the mobile phone:

“I do not have a cell phone but I need to surf the Internet because at school we get homework that requires us to do research,” said (Sipho);

“I use it for chatting; surfing the Internet; reaching people faster by SMSs; and playing music” (Lettie);

“To google, access websites and buy things on the web such as games” (Tiholo);

“Calling the police and parents; sending messages; store contact details” (Pummy).

Usage activity		Young	Older
Calls	Incoming	68%	67%
	Outgoing	53%	54%
PCMBBS	Sending	61%	37%
	Receiving	42%	23%
SMS	Sending	37%	20%
	Receiving	42%	23%
MMS	Sending	4%	2%
	Receiving	5%	2%
Internet surfing	Homework	8%	5%
	Learning	16%	8%
Email	Send & receive	4%	3%
Facebook	Chatting	25%	5%
WhatsApp	Chatting	31%	9%

Table 6.5: Age group usage
Source: Own

Table 6.5 illustrates popular applications used by the wider community and emphasises the voice communication used. Thematic and numerical data shows that older users liked the simplicity of communication that is brought by these devices. The majority of respondents indicated that through these devices, they can be informed of the deaths of their relatives. They further stressed how it saves them time and expenses of travelling. Some elders were fascinated by the fact that mobile phones can play music. They even wanted to buy a second mobile phone that could perform this task.

“If there is a funeral you can inform people fast. Even if a person is sick you can make calls” (Manku).

“I want to have a second one (mobile phone) which has a memory card so that I can play songs” (Rennet).

“I can use mobile banking to check my account balance; transfer money to anyone” (Peter).

“It makes things easier for us to contact people far away from us” (Zanele).

The qualitative and quantitative results reveal different usages between the young and older groups. The majority older group uses basic functions of the mobile phone whilst the younger group explores various applications.

6.4.4 Eagerness to use mobile devices

The community showed greater appreciation towards the manner in which mobile phones have improved their way of doing things, particularly communication. They further showed interest of continuing to use mobile phones even in the future. The respondents had different reasons that motivated them to initially want to use a mobile phone and continue to use it in the future. However, some reasons were similar. The motivation to want to use mobile phones was centred on the effectiveness of these devices in relaying messages and enabling easy information sharing. Pressure from their family and friends who owned the devices was an important enforcer to increased

ownership and usage of mobile phones. The participants showed interest in continuing to use mobile phones in the future, unless a better device replaced them. The table below shows the community's motivational reasons behind the need to have own a mobile phone and it should be noted that three of the interviewees did not have mobile phone.

Reasons	Number of respondents
Communication purposes	26
Information purposes	6
Pressure from peers	6
Impressed with the technology	7
Do not want a mobile phone	3

Table 6.6: Reasons for owning mobile phones

Source: Own

This statement from Andy summarises the motivations expressed by the community of Phake:

“I wanted to contact the bank and be notified about my account transactions. Send emergency messages to friends and relatives by SMS or calls. To look for employment; call and enquire about advertised positions”.

This is the response from Koko Doris “No I don’t know how to use them but if I try, I can understand them.”

The use of various features and applications were discovered, namely, Internet surfing, usage of social networks and mobile banking. These are discussed in the next subsections.

6.4.4.1 Features and other applications used

The members of the community used the features and applications in the mobile phones differently. The usage of features such as camera and videos was highly

recorded. The material recorded was later used for personal entertainment. The Bluetooth service was also used to send and receives music files. Some use the Internet to download music. Features such as dictionaries were also used by those who had access to the applications through their mobile phones. Classified Apps were used by several respondents. Goods were bought and sold on mobile classified applications such as OLX¹². The calculator feature was used by only six out of the 51 interviewed community members. Other members were impressed with how the clock and reminder features are helping them in their lives to be on time and to remember special events. One user said that with the clock feature his money can be spent on other things rather than buying a watch.

“I could not understand some terms and now with the mobile dictionary it's easy; I play choral songs for my class in order to guide them on how to sing. After doing this, they did well in the competitions” said (Timmy).

“I use it for calculating; use Bluetooth to receive files; record videos at any time, and take pictures,” said (Annie).

“Mobile calendar; surfing the Internet; and use calculator more often,” said (Tumi).

Community members used games and social networks as tools for entertainment. Figures 6.11 and 6.12 illustrate how media files shared via social networks are used for entertainment and playing games. Abraham could not entertain himself with music/games before he started using a mobile phone. The social network activities are examined further in section 6.4.4.3. The next section looks at the Internet penetration and its usage.

¹² This link gives an illustration of what OLX is and the type of services offered there: <http://www.olx.co.za/>

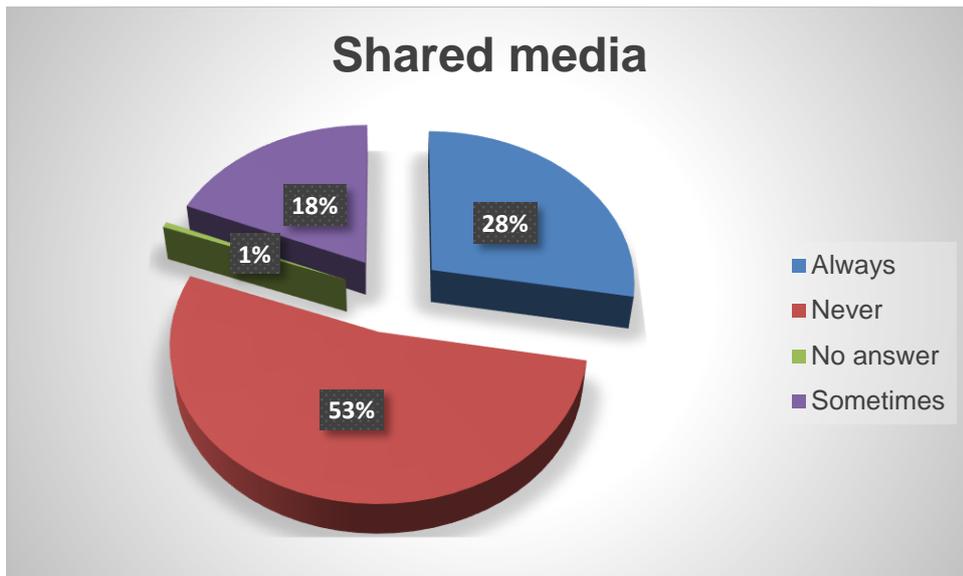


Figure 6.10: Watching shared media files

Source: Own

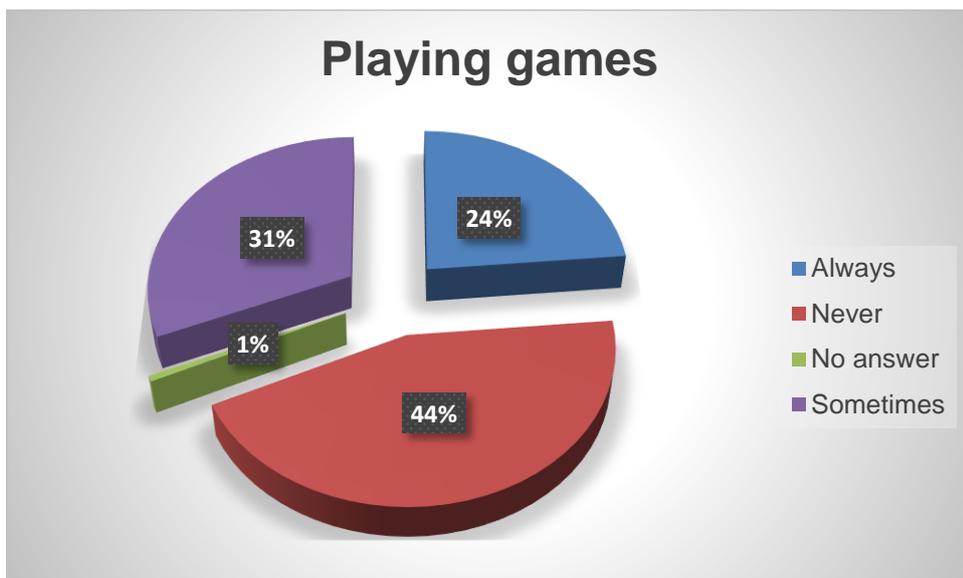


Figure 6.11: Playing games

Source: Own

6.4.4.2 Internet usage

The Internet is a widely favoured tool whether users were using it not. Those who were not using it were looking forward to using it. They praised it for its ability to give people information and for having “all the answers”, referring to Google. The Internet afforded them access to tools such as encyclopaedia and Wikipedia through the Google search engine. The Internet was regarded as useful for school-related matters such as

assisting with homework. Lindy mentioned that she mostly used Google to find out about what is happening in other places. It provides her with updates of what is happening around the entire country, such as entertainment and sports. Other community members had this to say when asked if they thought the Internet was important for improving their language:

“It is very important. You get to know about everything happening around the world”, said (Joyce).

“Yes, it is very important. One can get access to advertisements of assets (like furniture, one can enquire on prices and determine affordability) and they provide information. You can reach the US with it. You can look at the skills required for the posts advertised to see if you would qualify,” said (Andy).

The diagrams below illustrate Internet usage by the wider community and what it is used for. The community’s responses have, however, showed interest in the Internet application. The high number of non-usage illustrated in Figure 6.12 is important to note as the presence of smartphones was recorded to be higher in this community, refer to section 6.4.

Figure 6.13 shows that more community members use Internet to learn about new things. This resonates with various responses shared by the respondents stating how Google makes their lives better by educating them. Thus affirming the learning and training sub-theme. The low usage for homework may be the result of the fact that not all members surveyed had school-going children who might have used the Internet for homework purposes.

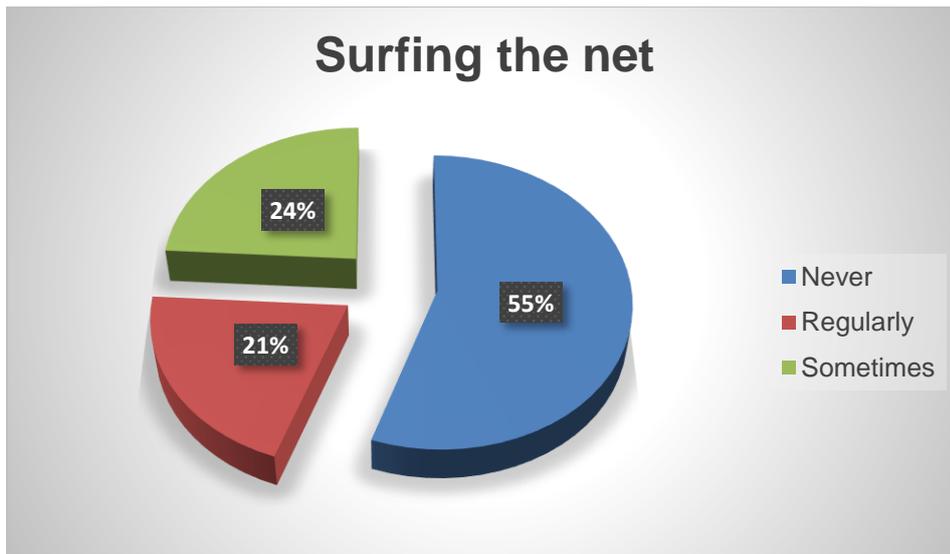


Figure 6.12: Surfing the Internet

Source: Own

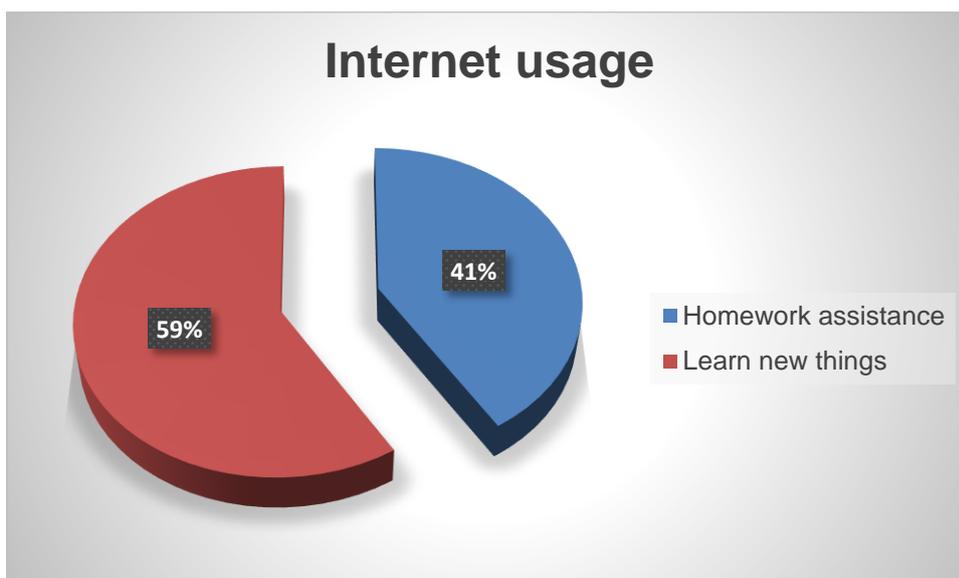


Figure 6.13: Internet usage

Source: Own

The next section discusses the different uses of social networks.

6.4.4.3 Usage of social networks and chat platforms

The use of social networks is prevalent in the community of Phake, particularly among the youth and the working group. The main reasons for using messaging applications were that it enables them to communicate even when they have less airtime. The

ability to communicate with many people simultaneously at a low cost was a driver behind the use of these applications. The ease of accessing information was another reason for using it. The information aspect resonates with the empowerment theme, making it another sub-theme. The mostly used platforms were Facebook and WhatsApp, while Twitter, WeChat, Mobifun and Mxit were used only sometimes. In the chat platforms WhatsApp was dominating the space with 62 per cent, (see Figure 6.14). The other chat platforms that competed with it were at 15, 14, and nine per cent for WeChat, Mobifun and BBM, respectively. BBM had the lowest percentage. This was quite intriguing because it is the one of the first instant messaging platform to be available on Blackberry devices. The application is also available like the WhatsApp and yet its uptake is still lower. This may also be due to the low number of Blackberry devices in this community, as stated in section 6.3.1.

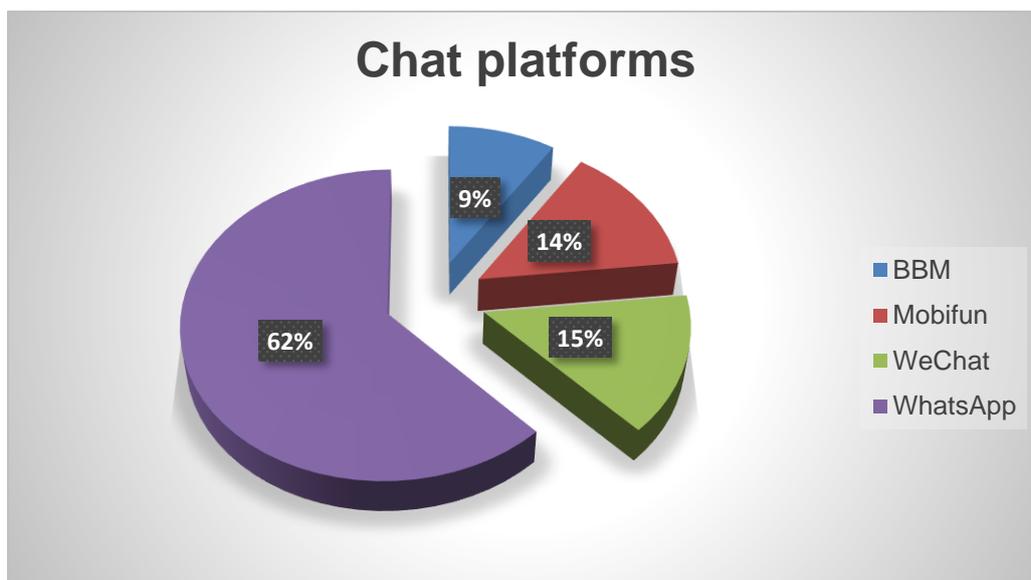


Figure 6.14: Chat platforms

Source: Own

Facebook did not have much competition from similar platforms in the community of Phake. Most of the social network users preferred Facebook to its competitor, Twitter. Facebook, Twitter and LinkedIn had 78, 18 and four per cent of users, respectively. On a group level, it was discovered that the educators used social networks for personal purposes only. They were not using them for any education-related matters. One of the educators stated that he had not thought of using social networks for

educational purposes. It is generally used for communication to save airtime and discuss school-related matters.

“Facebook, WeChat, WhatsApp enables me to look for people closer to where I am and suggest that interact with them. I use different ones to access all my friends. It saves me money and enables me to chat with friends at a cheaper rate. I prefer bundles because they are cheaper,” said (Moshe).

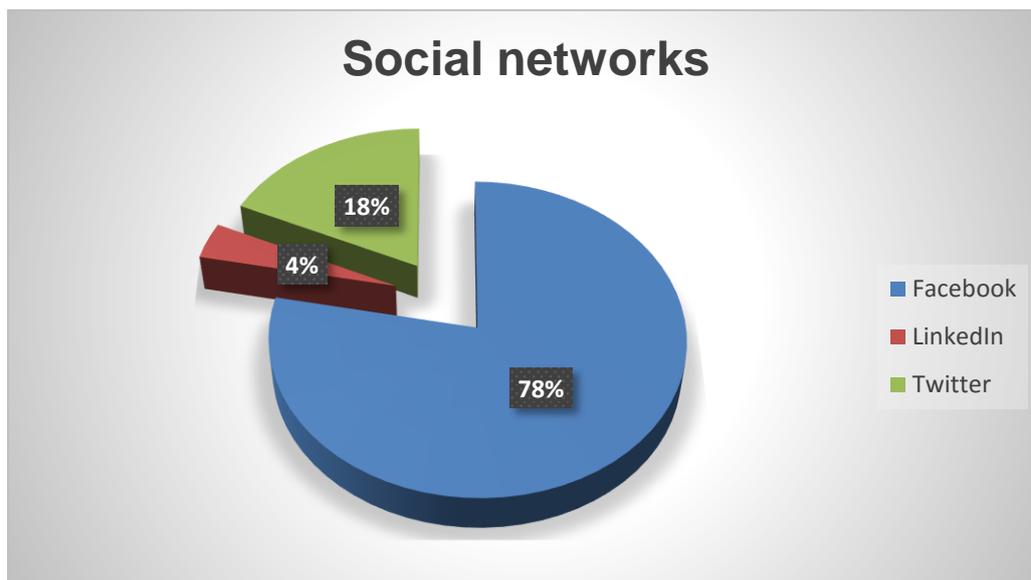


Figure 6.15: Social networks used

Source: Own

The community was not only interested in the basic uses of mobile phones but they seemed eager to learn about other features and applications. When asked if they were able to set up a community interest group on social networks and if they thought this could be beneficial for the community, their responses indicated that even though they did not know how to set this up and the importance of the feature, they wanted to learn. They did state that if they were to be taught how to do it, they would not have no problems of doing it on their own and using it. Emphasis was also placed on making time to familiarise themselves with such features or programmes.

6.4.4.4 Mobile banking

The community was asked if they knew what mobile banking is and if they had access to it. They were well informed about mobile banking. Even those who were not using

it knew what it was and how efficient it is. Some did not have full knowledge on mobile banking but they had an idea of the things that they can do with such an application. Most people were in favour of mobile banking and showed interest in using it in the future when they are in a position to do so. This clearly will be dependent on their access to a bank and having enough funds in their accounts. This links back to the employment issues that are a challenge for this community. Mobile banking was regarded as important because it saves travelling costs and time spent in queues at the banks. It was seen as an easier mode of sending money and accessing their account balances at any time. It also enables them to view their bank statements without travelling to the bank. Through mobile banking, respondents expressed the ability to purchase prepaid electricity and airtime from their MNOs (see Figure 6.17 and 6.18).

“It saves time and avoids carrying a lot of cash; it makes it easier to transfer money at home than going to the bank,” said Mavis.

“I use it for electricity, airtime and transfers. I will continue to use it, unless I lose money through mobile banking,” said Paul.

In addition to the community’s statements, the following diagrams show accounts of how the mobile banking was used. Figure 6.16 displays the frequency of how the community uses the mobile banking service. Other services such as airtime and electricity are presented in Figures 6.17 and 6.18. The airtime purchases were higher than electricity purchases. Those who were always using their mobile banking to buy airtime were at 15 per cent compared those buying electricity who were at five per cent. There was, however, a high rate of non-usage of this service. Percentages of those who were using it occasionally were slightly higher for both services at 21 and 11 per cent for airtime and electricity, respectively. The difference in usage between the two services may be the result of limited knowledge on the availability of electricity service on mobile banking. A sub-theme on knowledge gaps for the digital divide can be deduced from this given that learners and educators had related issues (see section 6.3.5).

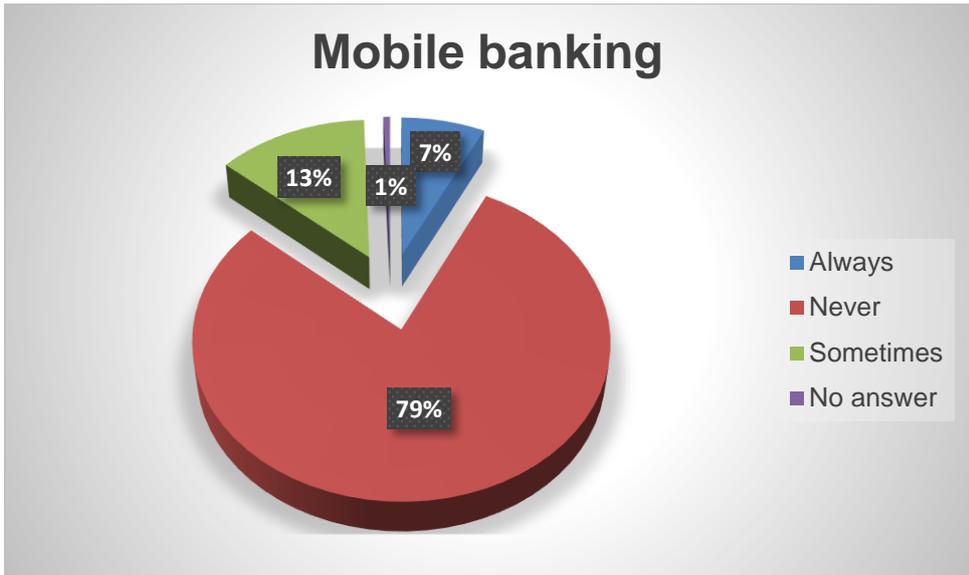


Figure 6.16: Mobile banking

Source: Own

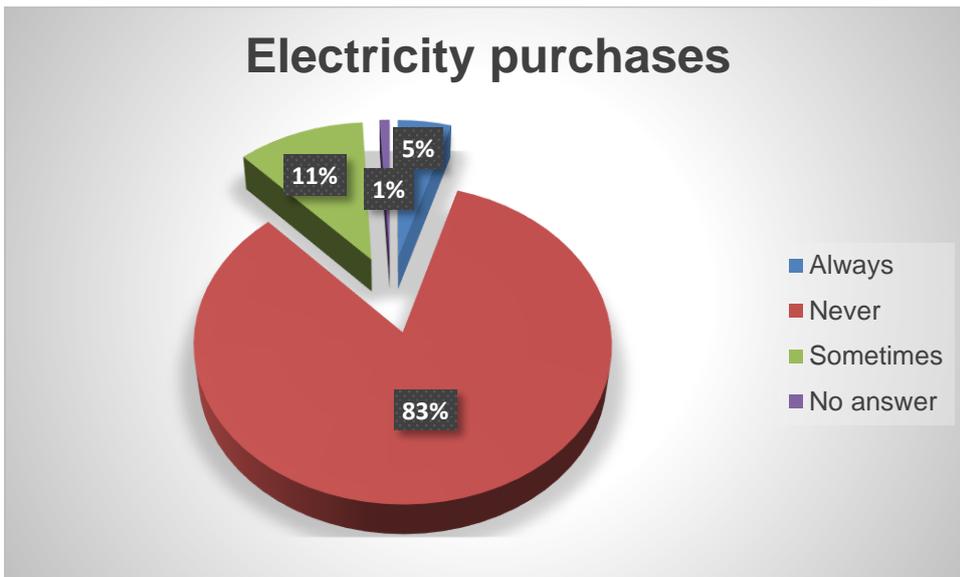


Figure 6.17: Electricity purchases

Source: Own

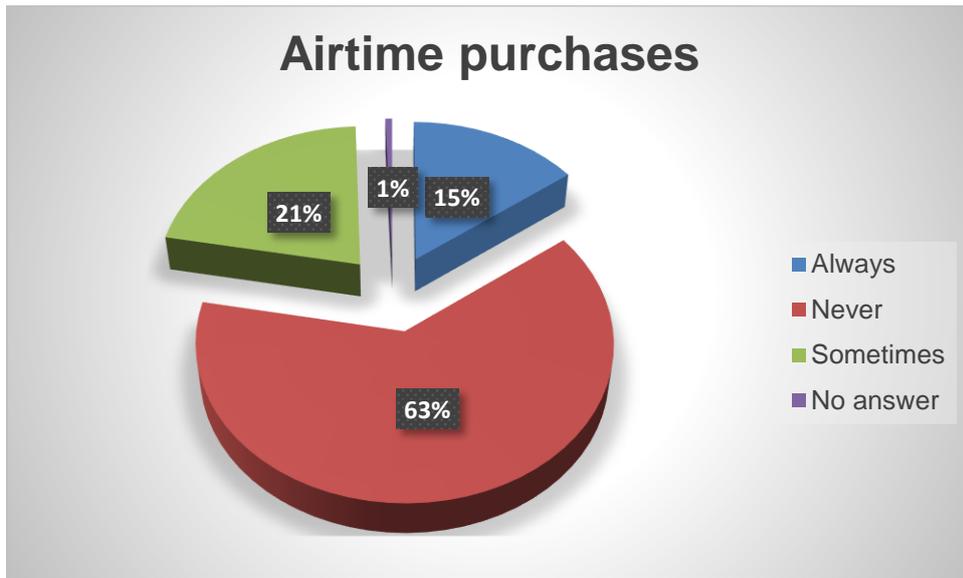


Figure 6.18: Airtime purchases

Source: Own

The ability to do banking in the comfort of their homes gave them a sense of safety. One respondent said that with mobile banking she will not have to worry about thugs mugging her. A respondent who was not yet using the service shared these sentiments:

“Not yet, but I will use it in the future because it saves time. You can access everything while relaxing at home” (Lesege).

There was also an account of a previous user who experienced the negative side of mobile banking and was not happy with the experience. The respondent shared that he encountered problems while using the service. His account was illegally accessed and as a result, he lost some of his money. However, he still mentioned that he might consider using it in the future, only if the security issues were to be improved. These are the challenges that may influence people not to look at such technologies with a good attitude. With that being said, the next section reports on the negative attitudes noted during the research process.

6.4.5 Negative perceptions

In as much as there is a wider usage and eagerness to using mobile phones and its various features, there were some who did not share similar interest. This was the feedback received when asked if they thought mobile phones were important. Among the learner group, there were mixed feelings on the importance of mobile phones. There were those who did not like the mobile phone itself. They felt that it was not important, although they owned one. The dislike of the mobile phones was related to the misuse of it and people not knowing much about how it can be used. There were four learners who shared similar feelings. This learner owned a mobile phone because the parents had bought him the device. These were his sentiments towards mobile phones:

“They bought it for me because I had done well in school. Personally, I did not want it, I wanted a play station” (Kabelo).

The messaging and social networks were not highly favoured by some of the community members. Their dislike was caused by the likelihood of these devices encouraging anti-social behaviours. This is what Tilly said about the use of social networks:

“I am not using it; I do not want to have a headache. For example, people who chat a lot close their ears and watch their mobile phone screens, you can beat them up”.

When asked about the features that they were not using, this is how Pretty responded: “Yes, the Internet, because it costs money and I do not understand how to use it.” Later, when asked if she thinks the applications like the Internet are valuable in increasing one’s knowledge base, she said: “Yes, for those who are using it. I am not interested in it because I know less about it (Pretty)”.

This shows that even though the MNOs are saying that their Internet rates have gone down and it is affordable to access the Internet through data bundles, not all people are aware of such information. Access to these services is still viewed as quite expensive by potential users. Lack of knowledge on how they can assist them is still

prevalent and therefore contributing to the issue of digital divide. The respondents were not willing to use other features because they were scared that they may damage their devices.

This is what Mona shared with the interviewer:

“I am afraid to use them because I might damage it or do things that will make my phone dysfunctional”.

Other perceptions that were observed around the use of mobile phones were that it exposed people to danger. The safety theme is recurring here now in terms of the device itself. These respondents felt that mobile phones increase the crime rate and incidences of people being murdered. They also believed that criminals can trace you through your mobile phone and kidnap you. The uneasiness could be the result of the misuse of mobile phones that is discussed in section 6.5. The respondents who had these views regarding mobile phones all owned the device. A few of them, however, expressed that their parents bought it for them. Others were voluntarily using them, showing that such concerns should be properly looked at so that all community members understand both the good and bad that may come from using mobile phones. The results express a need to teach people on how to leverage what the device has to offer. Here are some of the statements from the respondents when asked if they thought a mobile phone can improve people’s safety:

“No because people can call you when they are drunk and insult you. People can trace you with it and kidnap you” said (Cate).

“No. It can put people's lives in danger whereby criminals are targeting such a phone, e.g., a mobile phone with a television,” said (Leah).

The next section presents more safety and security issues relating to mobile phones.

6.5 SAFETY AND SECURITY WITH MOBILE APPLICATIONS

This section focuses on the security and safety of mobile phones. The focus is on how the community uses the mobile phone for their own safety. The section also looks at the security concerns that the community members have regarding the use of mobile phones. The safety and security includes health-related emergencies. Mobile phones can be used for making calls, sending messages in order to inform loved ones about their state of safety. The community indicated that they use their mobile phones to contact the police, ambulance, fire brigades and inform people when feeling threatened or in danger. They are also contacted by the banks when there are any irregularities in their accounts. Lucy, as an unemployed youth member, sees her mobile phone as being very important in improving her safety. She uses the PCMB to inform her family about her safety issues. When asked if they thought mobile phones can improve their safety, this how Lucy explained how she uses the PCMBs for people to understand her state when sending it:

“When I am in danger I will do a lot of please call me backs so that they can realise that I need help. One PCMB is for greetings and more than three PCMBs mean it is urgent.”

Tlholo shared this information with us regarding mobile phones as safety apps:

“Mobile phones have now improved in a way that suits everyone. There are things called panic buttons whereby you can just press "9" in case of emergency, which will alert relevant departments”.

This is an app¹³ that enables any smartphone user to press a button when in danger to alert those in the safety list on the user’s emergency. An SMS or email is then sent to the emergency contact list with the location of where the sender is. Find me¹⁴ was

¹³ More information on panic button and other related apps can be accessed on this link:

<http://www.redpanicbutton.com/>
<http://www.cellphonesafety.co.za/how-to-set-up-a-panic-button.html>

¹⁴ More information on Find me can be accessed on this link:

<https://play.google.com/store/apps/details?id=com.FindMe>

another application that was cited by respondents as useful for safety purposes. It allows one to identify the exact location of the person they are looking for.

“If you are kidnapped, they can track your phone to locate you” (Gift).

Mobile phones were also regarded as improving the community’s safety because they enable them to send out messages of distress in a discreet manner, without the intruders noticing. The theme of safety further emerges with the sub-themes on emergency and security applications. The discreet messages were either sent by an SMS or buzzing the people that they were requesting help from. In all the cases that were reported in this manner, the intruders were scared off before harming the targeted families. Security apps were not used for personal safety only. Other users have found innovative ways of extending such safety benefits. For instance, Mark relayed a story of how a mobile phone with a ‘find me’ app was put inside a friend’s vehicle for tracking reasons. When the vehicle was stolen the app was used to help locate the vehicle and it was successfully recovered. This story shows how the users of mobile phones can be innovative and of their ability to ensure that it benefits them. The adaption sub-theme is noted in this regard. However, such benefits can be exploited only if the user has full knowledge of particular devices or applications.

While others felt protected by having a mobile phone with them, others did not fully agree that it promotes safety. Some felt that mobile phones expose people to unsafe practices like the social networks enabling people to befriend each other without knowing them. Mobile phones were reported to be used for demeaning purposes such as insulting others.

“Some people use it to insult others. Sometimes you dial a number by mistake and it goes to the wrong person then the person on the side other insults you instead of understanding that you dialled it by mistake. Mobile phone etiquette must be taught” (Lucy).

“I do not like it and the way I heard that people use it. People are having friends that they have never met and date them. This might not be safe,” said (Paul).

The possibility of misuse in such devices also affects the people's likelihood to use some features. For instance, services such mobile and internet banking face challenges of users not being attracted to them. Some of the respondents had these issues, refer to the last paragraph of section 6.4.4.4.

6.5.1 Emergency situations

Emergency incidents were reported to be easily managed currently through the use of mobile phones. Some have even taken decisions not to use security codes to enable easy access to their mobile phones in case of an emergency.

“They can access my contact list and check for my parents' contact details. It will be easy because my phone does not have security password,” said (Naomi).

When asked on how people can identify their emergency contacts, the majority of people reported that they use relational names such as son, wife, granny, love and brother for people to see how they relate to them. There were, however, those who did not have the emergency contacts or any way of enabling people to make contact during emergencies. This is how one of the respondents who did not have the relational names responded:

“By accessing my recent calls, chances are that my recent call should be where I am going or where I have just left”, said (Tom).

Other's description of their relational contacts includes using pictures to enable easy identification. This is what one learner had to say about emergency contacts:

“They can access my contact list, which will have a photo and a name so that the person who was called can be identified when they come to the scene,” said (Lesiba).

What was remarkable was that a particular learner did not have a mobile phone but when asked about how in case of emergencies people would know who to call, the learner had a description of how his mobile phone would function. He mentioned that

his contact list will have names and pictures, thus enabling people at the scene to easily identify the person they are expecting to come and see him.

6.5.2 Security of applications

The safety of the applications that were designed to make the lives of mobile phone users easier is in some instances compromised due to thugs who want to use similar platforms to enrich themselves. This section looks at how such criminal activities affect community members who are exposed to such applications. Mobile phones have two sides, the good and the bad. However, its good needs to be leveraged and those benefiting from it must take upon themselves to educate those who are not aware of its benefits. Steps should be taken to show those misusing the benefits that they are taking away from others. The story of Magdalene, who received several missed calls from a neighbour who was trying to inform her that she was in danger shows the good side of using such devices. Upon noticing the several missed calls, Magdalene finally went to the neighbour's house and scared off the thugs. If Magdalene was not notified, the thugs may have brought distress to this family that was in danger.

The continued growth of mobile applications shows how users can easily break rules as, in the case of Mark's friend in section 6.5, it might be illegal to replace vehicle-tracking devices with a mobile phone app. This therefore suggests that mobile phone education may be a need to ensure that users do not find themselves in trouble owing to lack of knowledge on what is acceptable and what is not. The next chapter looks at the community's views regarding training on the use of mobile phones.

6.6 TRAINING ON MOBILE PHONE USAGE

The results showed a great need for training on how mobile phones should be used. Most people emphasised that this particular training may be more beneficial to the elderly and younger people who are staying with their grandparents. This is Nestum's response to the question of the necessity of training: "Yes, there are things (referring to features/applications) whose functioning we do not know and these things can help us." However, another respondent had strong feelings against teaching people how to use mobile phones. According to Dikeledi, people should not be taught how to use mobile phones "because they will know more and start misusing it".

Even those who own mobile phones did express the need to be trained on how to use it. This does not necessarily mean that their mobile phones are not being used but they are simply saying that they are only using it minimally. “We need to know how to use mobile phones” (Motlalepule). A significant number of community members showed the need for training on other valuable applications that mobile phones can offer to them. As depicted in Figure 6.19, 85 per cent of the community expressed the need for training.

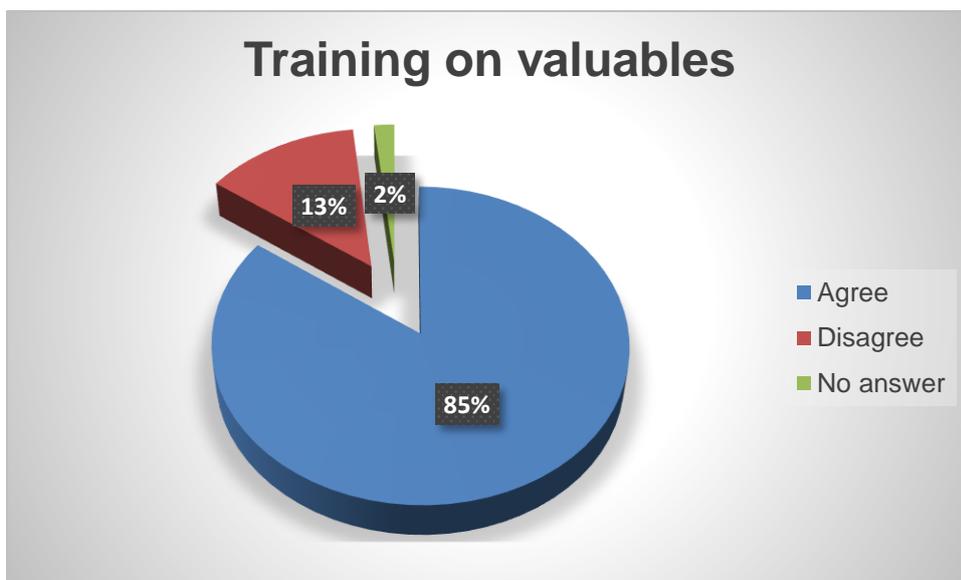


Figure 6.19: Training on how the mobile phone is valuable

Source: Own

This was what Nozipho said about training people on how to use mobile phones:

“Yes it is important so that when there are emergencies they can call. People should be taught how to apply and send online applications. People can google and get jobs and do research. When you lose your phone you cannot sleep, you would rather buy another one. People use WhatsApp to communicate for less and there are groups. There are also free minutes and benefits. The calendar can be used to check dates so that you do not miss dates. Now we can store messages and play games when we are bored”.

As she was speaking she scrolled on her mobile phone to talk the researcher through the features and applications on it. She was also not using social networks and chat platforms so some of the information she was relaying in this interview was based on what she had learned from other people.

6.6.1 Underutilisation of mobile phones

The issue of not using mobile phones efficiently emerged strongly, where respondents were citing that some people do not know how to use some of the valuable features that their mobile phones have. It was believed that through training, people can start using mobile phones more effectively. Mark says “Most of us buy expensive cell phones and we pay for those applications without using them. We buy phones that cost R6 000 for making calls and sending SMSs only.” Others reported that some people did not know how to send basic things such as PCMB and SMSs.

Illiteracy was cited as a determining factor on how individuals use their mobile phones. The illiterate would not be able to explore other features in their mobile phones because they may not be able to read or understand how some features function. For those who are literate, it becomes easier for them to figure out how the mobile phone’s features function. However, when analysing the responses even those who are literate were not using some features owing to not having knowledge of how to use them or how they can be beneficial to them. Literacy may be important in being able to read manuals and following the instructions, but it does not necessarily mean that it deters users from using mobile devices. Others mentioned that they do not see the value of other features or applications. Training, however, seemed to be important in introducing users to other features they are not using owing to lack of knowledge. Eighty five per cent of the survey results were in favour of receiving training on the use of other applications. However, the training offered should be designed in a way that will cater for the illiterate. With this training theme, underutilisation fits as a sub-theme to assist the researcher to further discuss causes related to it. This is what Bonny, a matriculate, had to say about the features that he was not using:

“Yes, some of them like the Internet, chat and others. I do not know their importance. Some I do not know what are they for”.

Other respondents had these to say regarding training:

“Yes, there are things that we do not know how they work and how they can help us” (Leeto);

“Yes, because technology is over powering us. Some people do not know how to surf the internet using their mobile phones. Others do not know how to share contact numbers especially old people” (Betty).

The underutilisation of the mobile phone is emphasised cited by both the qualitative and quantitative data. Users are aware of the features and applications that they need to explore and need support on learning how to use them.

6.6.2 Limited knowledge on how to use a mobile phone

The effective use of mobile phones, in most cases, depends on whether the user understands what to do with the device. Although some features are intuitive, others may require some knowledge. The extent to which the mobile phone can be efficient may also be dependent on at least basic knowledge. This was confirmed by respondents when they shared that the training is relevant for various reasons. Firstly, some users are old and were introduced to the mobile phones later in their lives and may not know how to use these devices. Others may even rely on family members to operate some functions for them. This becomes a challenge for those living alone as they may not have anyone to assist them, in cases of dire need, to use the device. The knowledge gap sub-theme reemerges, showing how some people are challenged with regards to mobile phone. Elders, in cases of emergencies, need to know how to use mobile phones to reach out for help when in danger. When asked if it was necessary to be trained/or taught how to use a mobile phone, this how they responded:

“Yes, there are things that we do not know how to use and how they can help us” (John).

“Yes it is important because technology is growing” (Neo).

“Yes, because technology is overpowering us. Some people do not know how to surf the Internet using their mobile phones. Others do not know how to share contact numbers, especially old people” (Lesego).

Those who used the mobile phone for pranks and other negative deeds were scorned upon. It was believed that training is relevant for these kind of people because their misuse of the devices affects those are supposed to benefit from using them. Training was also viewed as important towards curbing misuse of mobile phones, as well as the negative perceptions that exist around them.

“Yes to avoid pranks and misuse of mobile phones whereby people hide numbers caller ID to insult others” (Andy).

“Yes, for those who have negative thoughts around its usage, for instance, it causes feuds among partners,” responded (Timmy).

Some felt that training was not relevant as mobile phones come with instruction manuals that people can read to understand how certain features are used. This, to a certain extent, revealed that people respond based on their personal experiences and those who have not lived with the less literate may not be considerate towards them. The issue of the instructional language of a mobile phone was raised as both an enabler and a challenge. A participant stated that “if you know English, you will know what to do” (Betty). This is because the instructional manual is written in English. However, if you do not understand the English language you may struggle on features that are not intuitive or easy to navigate.

6.6.3 Online courses

The possibility of online courses was viewed with mixed feelings. On the one hand, respondents believed that online training will be beneficial for them because the material that they will be accessing online will be recent compared to the printed materials. An opportunity to increase their knowledge base was one reason that they showed interest in such a service. On the other hand, it was feared that this might not be possible due to poor network connectivity in the area. Others felt that they may not be effective as they do not have access to such services and they do not know how

they function. Those positive about online training felt that this would allow them to get “access to new materials and be one of the first people to gain such knowledge because things arrive earlier on the internet than on print,” said (Timmy).

Mark also shared these sentiments with us:

“Information and technology change every day so I need to change to be on par with it. What I learned two years ago might not be relevant now due to constant improvements. To be functionally literate, you need to upgrade”.

An important point to note is that there is general interest, provided access will not be a challenge. People can be taught how these services should be used and what impact it may have on them so as to maintain the interest. Figure 6.17 below, shows that 76 per cent of the community members would like to have access to online training to increase their skills. A lesson learned from this outcome is also that the community does not want to commit itself to programmes that it knows may not be accessible. This, therefore, says that for programmes to be sustainable and well adopted, they should not require additional resources from the users themselves. It should be resources that the community may be able to access easily. For instance, if development practitioners want to introduce a mobile phone training course, they need to ensure that the devices required and any additional resources should not be at the expense of the users.



Figure 6.20: Need for online training

Source: Own

6.6.3.1 Knowledge about educational apps

The community lacked knowledge on educational applications that may be useful to them or their families. The majority of them did not know such applications existed. They however, showed interest in using the applications if they knew what their functions were for. One respondent was using the news application such as *News24*, where she indicated that she receives valuable information on health and business matters. Another application that was used by one of the respondents was *ebsohost* and *Google scholar*, which was said to be useful for accessing educational material.

The mobile phone usage questions enabled the researcher to identify more themes as well as sub-themes emanating from the qualitative and quantitative data. Communication themes were expanded by adding sub-themes like voice, messaging and social networks. The digital divide theme had an additional sub-theme, knowledge gap, Internet and social networks. Their focus is on those who are unable to utilise certain services, thereby creating a division of those who know and those who do not know. Sub-themes relating to freedom were also identified. These were: usage, negative perceptions and eagerness to use the mobile phone. The aforementioned sub-themes were inductive as they were derived from the questionnaire. The information sub-theme was also added under empowerment. The safety theme was

also expanded with emergency and security sub-themes. Two sub-themes emerged under training namely, underutilisation and misuse.

6.7 CONCLUSION

This chapter presented the findings of the field research of the Phake Rebone community on how it is using mobile phones. The findings showed that the community does have issues of high unemployment with the majority of people depending on family members and child support grants. Infrastructural challenges were also noted, whereby the primary school was overcrowded and the extra corrugated classrooms were not effective in resolving the problem. The community had limited access to water where, in most cases, they have to buy from those who have boreholes. It was recorded that the community adored mobile phones because of making their communication with the people they care about quicker, easier and cheaper. Related to infrastructural challenges, was the interrupted electricity and poor network coverage. Some networks were functional in certain areas, with the Vodacom network being the mostly accessible owing to the availability of the terminal. The challenges relating to connectivity for the MNOs were also noted, with some community members owning multiple SIMs cards to ensure that there is no communication breakdown.

Mobile phones proved to be helpful with school-related matters, such as using Google to search for information and completing home work. Technology illiteracy was noted in the health, educator and business groups and elders in the community. They were not confident that they can use the devices. In most cases, they were referring to them as the tools for the younger generation. There was a general appreciation of the Internet as it enabled some community members to do their schoolwork and enabled others to continue learning different things through search engines. The use of mobile banking was reported to be important in that it saved users time and travel costs. They were also able transfer money, buy airtime and electricity while at home. The use of social networks and chat platforms was regarded as cheaper and it enabled them to reach a number of people instantly while saving money.

Mobile phones were further used for safety and emergency purposes. The community expressed the need for training in order to learn about the features and applications

that could benefit them. Training was hailed as valuable and to also teach those who are misusing the device to understand how that affects other users and how they can improve their behaviour. The findings of this study strongly suggest a high level of importance around the use of mobile phones, the key functionality being communication. There is no doubt, in terms of communication, that the community at large considered the devices effective. However, with incremental growth of other applications that continue to connect people and enable quick and cheap exchange of information, the community seemed to be lagging behind. The use of social networks, professional networks such as LinkedIn and the Internet in looking for employment or networking was quite low.

The analysis resulted in seven dominant themes namely: communication; livelihoods; digital divide; freedom; empowerment; safety and training. The identified themes were further expanded to have sub-themes to enable the researcher to discuss the main theme in different ways. The themes will be discussed in the next chapter. The chapter will also provide the implications of these findings in terms of the study's research question.

CHAPTER SEVEN

7. DISCUSSION OF RESULTS AND PROPOSED MATRIX

7.1 INTRODUCTION

The findings of this study were presented and discussed in Chapter Six. This chapter is a continuation of the analysis of the results presented in the previous chapter. The results are discussed with reference to the research questions posed in the first chapter. Objectives that were set for this study were also used to guide the analysis and discussion of results. The indicators for the studied case are identified and a matrix is created based on the outcomes. The next section discusses the findings as to how they influence the direction of this study. This will be followed by the use of indicators as prescribed for the community of Phake Rebone. A developed matrix and guidelines are provided on how it could further be replicated in other rural communities.

7.2 DISCUSSION OF RESULTS

This research was undertaken in an attempt to find out if an effective matrix could be developed which could be used by the community to improve their mobile phone usage. The community of Phake Rebone was selected for this research's case study. In conducting the research, the following main question was asked:

How to develop a matrix for measuring the impact of mobile phones on development in rural communities?

The posed question was relevant for this community especially at this time when it was posed. Although there has been mobile phone usage in the area before, at this point in time, it was different owing to the continued presence of new applications and new uses of the device. This question assisted the researcher and the Phake Rebone community to understand how its community fares when compared with other communities. It can also assist in educating users on other trends or applications that they consider using for their benefit. By answering the research question, the

community would know how to improve the mobile phone usage if need be and obtain training on related technologies.

To obtain answers to the research question, questionnaires were formulated; taking into account the important findings that arose from the literature review in Chapter Two. The questionnaires assisted in addressing the posed research problem. Questions that were posed enabled the researchers to identify how a mobile phone was used by different people in the community from the learners, parents, educators, community leadership, CPF, to community health workers. The interviews were later followed by a survey of all community members to corroborate the results of the initial data.

In the analysis, the researcher started by presenting the findings of the first phase of the study. This was used as the base for identifying patterns and trends that were later analysed with reference to a quantifiable number. The interviews brought up issues that had been validated by the surveys. This assisted in ensuring that the discussed issues were not generalised to a small number of the community.

The discussion and further analysis of the findings in Chapter Six will focus on the themes arising as noted in the aforementioned chapter. The discussions start with community livelihoods, focusing on the issues of employment, services and infrastructure. This is followed by the communication theme discussing how different groups use voice, messaging and social networking services. The digital divide theme will also be discussed looking at connectivity, usage and knowledge gaps as well as their implications. The section on freedom focuses on how the community's capabilities are used in exercising their freedom in using mobile phones and related services. This is followed by empowerment looking in to the mobile phone enabled the community to access knowledge. Safety and security usage of the mobile phone will also be discussed, paying attention to the effects of misuse and abuse of the device. The discussion is then concluded with education and training needs of the community with regard to a more effective use of the mobile phones.

7.2.1 Livelihoods

This section discusses the community of Phake Rebone as a whole with focus on its challenges and strengths. This theme enables the researcher to reflect back on how the community lives and corroborate the results of the primary data with those of the literature based chapters. Contributing to the livelihood of the community is the community' core groups which are also discussed looking at how they all use the mobile phone for different purposes. Livelihoods are discussed looking into employment, community services, infrastructural challenges and banking.

7.2.1.1 Employment

The main observed challenge was the issue of unemployment. As was indicated in the literature study (GTZ 2008: 4, STATSSA 2012d: 23) the rate of unemployment was high and it was alarming looking at how the community survived. There were about 123 people who relied on social grants for a living. The active working group was only 95 of the 255 who were supposed to be employed. The dependence on social grants was either direct or indirect. The unemployed youth who did not get child social grants relied on their grandparents' grants. Others depended on family members for financial support. The results are daunting for such a community with a large number of young active people who are supposed to be in the workforce. Although there are other activities that could contribute to the economy in the village, such as the gardening and subsistence farming, it is mostly the elderly and pensioners who partake in such activities. The youth are not active and did not show interest in such agricultural activities. The natural resources were not used to the benefit of the wider community. When looking back to the assets that were congruent with this community, the use of social, human and natural resources could have assisted in leveraging the small scale farming for food security as well as income. The proceeds from the gardens would assist in ensuring income to more households. If the youth were to combine their synergies with the elderly group that was already earning income from the vegetable gardens the economy of this community would be better. The community needs a more involved workforce in order for it to sustain even the small businesses in the community and curb teenage pregnancy as well as reliance on social child grants. The other noted challenge is that of lower education within the community. Only 40 per cent of the community have matric qualifications. Of these 40 per cent, only 11 per cent have furthered their studies to improve their employability. The community's low

educational levels maybe a contributing factor to the high unemployment rate in this community.

7.2.1.2 Community services

The services used by the community are those of education, business, CPF, health and municipality. There were some noted challenges related to some services, discussed under infrastructural challenges below. The educational services are provided by the educators and the required infrastructure is available both within Phake Rebone and neighbouring Phake villages. The primary school is, however, faced with overcrowding and limited ICT facilities. The quality of learning is therefore impacted as other learners have to study in shack structures. The overcrowded classrooms also do not allow all learners to receive the attention they need to perform to the best of their abilities. The business sector provides community members with easy access to consumables. The high presence of the Pakistani and Somali nationals helps some community members to make money through renting out their spaza shops. Viewed differently, though, this letting trend is robbing the owners of these establishments the opportunity to make more money, as they closed their own operations to give the business to the Pakistanis and Somalis. The unfair competitive strategies were blamed by locals, who were pushed out of trading business, to the practice of letting.

The health services are accessed from a neighbouring villages. The clinic can be accessed by walking to the facility or using taxis. The PHBC services were delivered directly to the households making this service more accessible. The other accessible service is that of the CPF when there are relational and communal fights and crimes.

7.2.1.3 Infrastructural challenges

Although the issues affecting the community's livelihood were not raised. The community experienced infrastructural challenges that they could deal with, as well as those that made their lives difficult. It was observed that the community lacked adequate classrooms, ablution facilities, adequate safe water supply, and good telecommunications network. Issues of overcrowded classrooms were in agreement with the literature findings (DBSA 2008: 37, Hollow 2010: 165). The school mitigated this by erecting additional corrugated structures to ensure that all learners are afforded

an opportunity to learn. This, however, puts more pressure on the educators as they have to cope with more learners than they are supposed to.

The community still relies on pit latrines which pose health and safety issues. Water is also scarce and the street piped water supplied by the municipality is erratic. This community is struggling to keep up with its livelihoods, further exacerbated by having to buy water from merchants. The agricultural activities mentioned in Chapter Four are also deeply affected by limited access to water. The plants sowed need water to grow. The irregular provision of the existing municipal water affects the irrigation schedules for the plants. This further affects the harvests, meaning the emerging farmers will not be able to make good money; possibilities of employing a few community members are also hampered. The scarcity of water in community substantiates the challenges affecting the rural communities' abilities to preserve and protect their livelihoods (DRDLR 2010: 6).

Telecommunication infrastructure is deemed old and poor (see Chapter Six, section 6.2.1) in Phake. The community struggles to access stable network connection for different MNOs, a challenge noted by Macueve et al (2009: 40). The poor connectivity affected the use of mobile phone communications and internet connection. This coupled with intermittent electricity supply, the benefits of ICTs are experienced with great difficulties in this community. It was reported that the community can go without power and stable network connectivity for at least more than 24 hours on a bad day. In a fast paced information society that we live in this could only mean that information sharing will be delayed. The noted connectivity challenges have major implications on both curbing the unemployment scourge and the use of mobile phones for purposes of searching for employment. The connectivity problems posed a breakdown in communication between the users and their contacts. More importantly, they may miss calls of potential employers or friends and families wanting to share employment opportunities with them. The connectivity also affected the connection to the Internet. The state of infrastructure in this community further proves the reports on mobile broadband and electricity (Esselaar et al 2010: 8, ITU 2014b: 74).

The challenges discussed above prove that the community has not reached full development benefits. Issues of access to basic necessities such as water should not

be affecting communities. Although the literature has proven that this is still a challenge in most South African communities (refer to Chapter Two), they compromise development. The water crisis does not only affect the community on a consumption level but on the use of natural resources such as land. This inhibits development as small scale farming could have contributed to the village economy. This would support the government efforts of reducing unemployment. The noted poor infrastructure, including that of ICT, affects this community's quality of life. These creates digital and income gaps between rural and urban communities which in turn leads to limited exposure to opportunities. Provision of water, sanitation, adequate classrooms and ICT infrastructure is a requirement for this community to enjoy full benefits of development.

7.2.1.4 Banking

In terms of the livelihoods, banking as a service is supposed to assist community members to access this service to make their lives easier. However, it was noted that many were not using it. This could be as a result of a number of unbanked community members as they seemed not to understand how it could be beneficial for them to bank online or via the mobile phone.

7.2.2 Communication

Communication emerged as a main theme that encouraged the use and ownership of mobile phones. Communication was carried out in different ways such as voice calls, messaging services and social networks. However, before discussing the communication sub-themes, the researcher would like to highlight the level of access to these communication-enabling devices. Communication in rural communities is enabled through access to mobile phones. The increased penetration of the mobile devices as illustrated in Figure 1 resonates very well with that of the researched community. Access to mobile phone devices proved not to be a challenge for the community members studied. There was a 100 per cent access to the mobile phone with a good representation of the smartphone.

There were more smartphones than imagined, given the challenges of unemployment and the cost of smartphones vs. standard phones (InfoDev 2012: 39). Smartphones had coverage of 39 per cent compared to the standard and feature phones which were

at 31 and 30 per cent respectively. The ownership of the smartphone is likely to increase in this community as those who did not own a smartphone were already stating that they plan to buy themselves one as soon as they have money. The increase in the uptake of smartphones contributes towards the penetration of mobile broadband for South Africa, meaning this influences a positive outlook of the country and the rural areas. A report by ITU (2014a: 3) forecasted a 55 per cent growth of mobile broadband subscriptions by the end of 2014 that will be coming from the developing countries where South Africa is a point of reference.

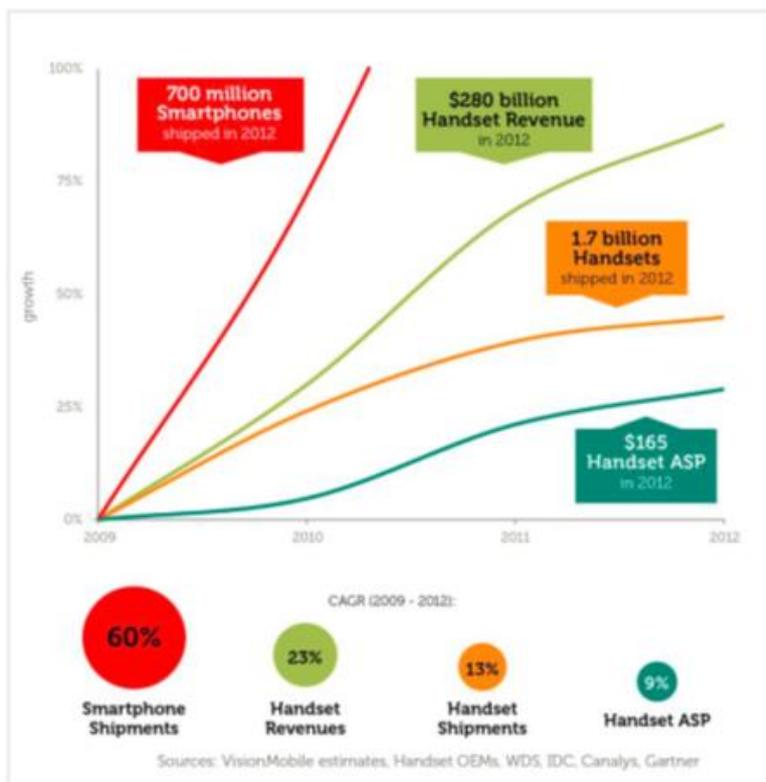


Figure 7.1: Mobile phones industry growth

Source: Developer Economics (2013: 14)

Penetration of different brands was also noticed. The large number of devices in the community was Samsung and Nokia. Nokia had a share of 57 per cent with Samsung having almost half of the market with 25 per cent (refer to Chapter Six, section 6.4.1). This contradicts some reports that have observed the growth of Samsung, particularly in smartphone share. According to Developer Economics (2013: 3), Nokia lost its share of the market to Samsung due to their slow reaction to the changing needs of customers when it comes to devices and apps. Although in high-end consumer

constituents, Samsung is competing with iPhone, in this community, there were no iPhone users. Nokia was also still leading in this community with relatively low competition from Samsung.

7.2.2.1 Voice

In the health group, the mobile phone was used mainly by colleagues to contact each other as well as PHBC volunteered to reach their supervisor during site visits with patients. The advanced services such as capturing patients' health progress or communicating their difficulties was only done through voice calls, which meant that if the patient did not want the home-based carer to hear some of their issues, they would not be able to get the required help in that moment. This would have been an area where the patient could directly talk to the health worker through other affordable messaging services (IICD: 2013: 10) instead of making voice calls.

Both the Rebone and the extension CPF teams relied on voice calls to communicate with the police. The communications were mainly about reporting criminal cases and matters that they felt they could not resolve as a community. They also used the mobile phone for communicating with the police on their administrative tasks such as organising workshops and training. Although the CPF members felt that voice calls were not a suitable means to discuss problems raised by the community members, survey results indicated that members actually wanted to report their issues through a mobile phone. This shows a trend where the device is not only used to call loved ones as noted in the literature (Comfort & Dada 2009: 50, Macueve et al 2009: 26) but to seek help when troubled.

The businesses operating in this community were amongst the groups who used the mobile phone for basic communication purposes. Support for the business was only in terms of ordering stock and was minimal. Other methods that could be used for promoting their services and products were not used. This contradicted the work of Infodev (2012:35). They had suggested that different messaging and SNSs were used to support businesses. However, they did indicate in their report that only a small number was the mobile phone for business related activities.

The numeric data illustrated that the community preferred voice calls to other features. The young and the older both used the voice calls maximally with 67 and 68 per cent respectively on outgoing calls. These results confirmed the thematic results of the study.

7.2.2.2 Messaging platforms

The leadership, like other groups, used the mobile phone for communication purposes as well. They were the only group that used the SMS feature to communicate with its members and the community. They used SMSs for meetings or events invitations when needed. Other noted usages of the mobile phone in other parts of Africa include the use of the SMS feature to source water and gather data for installation of some services. In Kenya, the community communicated with vendors in real time to report drinking water problems (Marot 2014). In the Ivory Coast, Abidjan, the mobile phone call data traffic was done by IBM to understand the road traffic trends, which enabled them to suggest new bus routes for busses in areas where the busses had not been reaching commuters (Marot 2014: 1, Mzekandaba 2013: 1). These examples show how the mobile phone is being used to improve the lives of the communities. Of importance to note is the involvement of the stakeholders who are already guiding these communities about how to increase the efficiency of their mobile phone devices. However, such advanced usages were not notable in the community of Phake Rebone.

WhatsApp is a smartphone messenger that replaces SMS usage. This app enables users to also send pictures, video and other multimedia content. It works just like SMS and uses an Internet data plan. It can be accessed by those using smartphones such as Android, iPhone, Nokia, Windows Phone and Blackberry. The use of the WhatsApp was as high as the unemployment rate. However, the use of WhatsApp for employment opportunities was actually lower given its usage and the fact that it was used mostly by the youth who are in the stage of seeking employment. This may be as a result of users not knowing how to effectively use such applications. Of the 110 who were using WhatsApp, only 50 users had received employment information opportunities through it. The problem could also be their insufficient networks with not enough bandwidth. Employment information shared on email is now very often shared through WhatsApp. Mxit was also reported as another popular messaging service

(Beger & Sinha 2012: 18, Hutton 2011: 1) but it was used by only a small number in this community. Its popularity may have been decreased by WhatsApp.

Even though WhatsApp could not assist community members to get information on employment opportunities, the mobile phone could still provide such opportunities. Recently, consumers are encouraged to become creators of content rather than only being consumers (see Chapter Three, sections 3.2.11 and 3.3.1). For example, people can use platforms like YouTube to create content that can be sold to an international audience. These could be in the form of movies, local dramas, and documentaries. The recorded material can later be uploaded on YouTube¹⁵ that exposes users to an international network. Once loaded on YouTube, the content creator can make money if the loaded content generates interest from the international community. This direct publishing of material on YouTube helps the content creator to make more money as compared to selling the content to a middleman who will later market to other broadcasters.

7.2.2.3 Social networks

Social networks used by the community were mainly Facebook for personal purposes. The high usage of Facebook was in line with the reported trends elsewhere in South Africa (World Wide Worx & Fuseware 2015: 1). The results showed that only 29 per cent of the surveyed people were not using Internet. In addition, of those who had access to Internet, about 55 per cent of them had never surfed the Internet. This shows that some people only use Internet for specific targeted applications such as chat and SNS. The overall use of the mobile phone applications by the researched community and the others is illustrated in Figure 7.2 below. The diagram also depicts where the community should strive to be based on the findings in order to be on par with their counterparts.

¹⁵ More information about content creation can be accessed on this links:
<http://youtubecreator.blogspot.com/>
<http://venturebeat.com/2009/02/12/the-most-direct-youtube-monetization-buy-videos/>

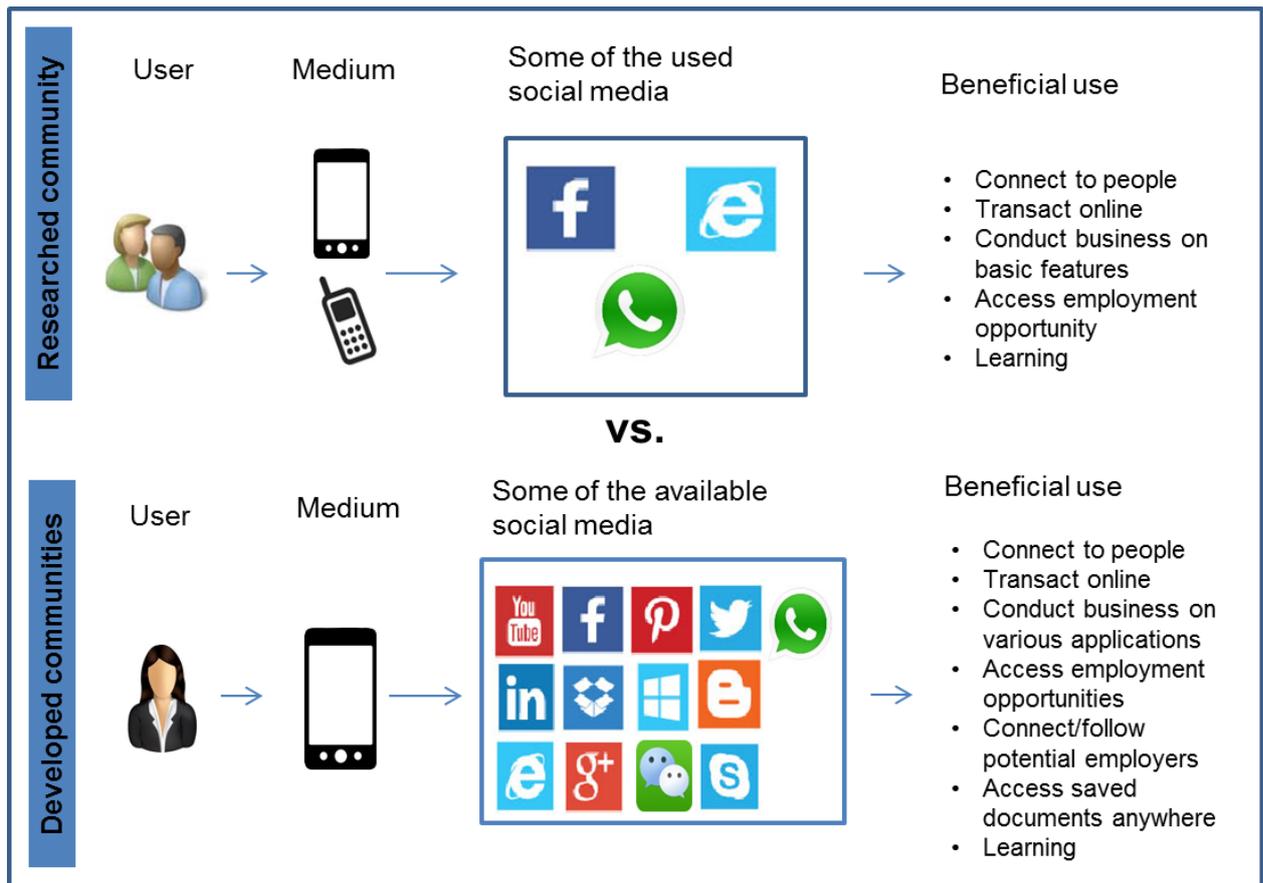


Figure 7.2: Mobile phone comparison usage
Source: Own

7.2.3 Digital divide

Digital divide exist for various reasons in different communities. The standard definition as stated in Chapter One, section 1.2.10 and Chapter Two section 2.4.3 relates to lack of access to some ICTs, but this study has proved it otherwise. Digital divide is also manifested in different various ways, starting with device access, poor infrastructure, and knowledge of a particular technology. As a result, this study uncovered connectivity, internet access, social networks, mobile banking, and knowledge gaps to be contributing to the digital divide concept.

7.2.3.1 Connectivity

The issue of poor infrastructure affected the community's access to MNO's signals, thus affirming the reports in Chapter Two section 2.4.3 (Alampay 2006: 14, Ariyabandu & Zengpei 2009: 30, South Africa 2000: 17). Inadequate provision of telecommunication network towers meant that users subscribed to other services

besides Vodacom suffer in accessing the signal. Users of MTN, Virgin mobile and 8ta in the area struggled with connectivity. The Vodacom subscribers also struggle when there is bad weather, suggesting that their network terminal was also not servicing them adequately. The unscheduled interruptions meant that whenever there was a connection breakdown, internet access would go down as well. This means that the users would face challenges with delayed messages or connecting to the world as for every minute there would be no connection. As a result, they would be missing out on what is happening in the world, thus experiencing a divide and disconnection. The use of Internet is often disrupted in Phake Primary due to the unstable connectivity. Therefore, the concomitant failure of electricity and network further limits the extent usage of the mobile phone and its related technologies in schools. Issues of poor ICT infrastructure interferes with development in this community as they cause a disruption of capabilities. When the people's development capabilities are not realised, options will be restricted thus leading to limited freedoms to do what they like. This therefore impacts on people's choices to use the mobile phone freely.

7.2.3.2 Internet and social networks services

Access can also be looked at on the related technologies that are associated with the mobile phone, particularly the feature and smartphones. Access was explored based on applications such as the Internet, social networks, messaging platforms, and other features widely used by mobile phone users. Applications such as the Internet are capable of introducing users to various activities such as the SNSs and new knowledge through various search engines, also referred as information resources (van der Weide 2012: 5). According to Breslin and Decker (2007: 86), the Internet provides an interconnection between people and content in a meaningful way. Moreover, the SNSs are enabling users to connect on a social and professional level. This was evident on accounts from the community on how they have learnt different things from the Internet. It also enabled some of the community members to connect to SNSs.

The use of the Internet in the community was still low; however, this does not paint a bad picture, as there are accounts of usage and interest in the application. According to the ITU (2014a: 5), there are about four billion people in the world that are not yet using the Internet, of which 9 per cent are from developing countries. The knowledge

gap in Phake Rebone as far as the Internet is concerned is at 29 per cent taking into consideration the number of people who are connected daily. This is not bad given the profile of the community. The more people in rural communities use smartphones and have knowledge about applications such as the Internet, the more such statistics will improve for the developing countries. Growth is very rapid and these figures will change most likely dramatically in the next few years. In this study's case, the high penetration of the smart and feature phones contradicts with the usage of some applications/features. The usage of such applications/features was lower than the penetration level of mobile phones. Features such as gaming, Bluetooth, and downloading content were used minimally. Although the Internet was used to learn new things, users had not used their mobile phone to download books or educational content.

The use of mobile phones in Refitlhile Primary School seemed to have replaced the use of computers. The reason behind this was that computers at the school did not have Internet access and it was easier to connect to the Internet using the mobile phone. Phake Primary School had access to the internet although it was limited due to the lack of budget for the data bundles in some months. The mobile phones were therefore the first option when educators wanted to do research in preparation for their classes (Ariyabandu & Zengpei 2009: 16). Access to the computers in both schools was therefore inhibited by the schools' limited finances. This is a good lesson as future incorporation of the Internet into classrooms will require solid financial support to enable full access to ICTs.

However, there is already a noticed shift from PCs to mobile devices. A report by YesMail¹⁶ indicated that 64.5 per cent of emails have been opened on a mobile phone rather than on a PC. A concern was raised on a growing gap of ICT illiteracy between learners and educators. Learners showed interest in exploring ICTs at their disposal. In contrary, their educators did not share a similar interest. This then made learners to be more advanced than their educators. In this context, educators were more educated than learners, yet struggled with ICTs. This finding was therefore

¹⁶ More information on Internet access via the mobile phone:
<http://www.yesmail.com/company/news/yesmail-email-benchmark-study-shows-number-mobile-orders-jumps-almost-40-percent-mobile>

contradicting Sikhakhane and Lubbe (2005: 5) their assertions that lack of education contributed to digital divide. A thorough study is required to get to the bottom of this lack of interest in ICTs by educators. This also causes a delay for learners as no means will be made to introduce ICT related methods of teaching and learning when the educators are ICT illiterate.

7.2.3.3 Mobile banking

Digital divide was also noticed in terms of accessing services like mobile banking. The application itself is only accessible to those who have a bank account. This meant that not everyone who wanted to benefit from this service was excluded. The limited use supports Beger and Sinha (2012: 18) findings regarding low data on rural populations' mobile banking usage. The emerging evidence shows that there is not much to report about on the divide at this level. Those that had access to the service often did not use it due to security issues related to the service. This means that the rural communities still have a long way to go in order to access such a service.

7.2.3.4 Knowledge gaps

The core groups were not using the mobile phone for the tasks related to their daily activities except the education group. For instance, the noted absence of the mobile phone utility in businesses in section 7.2.2.1 relates back to limited knowledge on how to ensure that the mobile phone fully supports their businesses, contradicting Macueve et al (2009: 26) reports. A kindergarten transport services provider complained about how some parents were not preparing their children on time, whereby he must wait for them whilst preparing the child. In such cases, both the driver and the parent could communicate to ensure that when the driver arrives, the child is ready. Other options could be derived such as using the mobile phone to give the parents support that would enable them to prepare their children on time. The reminder feature, highlighted in other studies (Munyua 2009: 124), could have been beneficial. This is another factor related to limited knowledge where users are not exploiting features/applications that could support their daily activities.

The issue of capability as discussed by (Gxulwana 2010: 89) was noted whereby the community lacked knowledge on how to use the content creation method offered by content applications such as YouTube for income purposes. This opportunity was not

seized by any of the researched group due to not being exposed to such information and expertise on how to go about publishing content online. This is another form of a digital divide, as this community, with its high unemployment rates, could benefit from selling content and help sharing local content on international platforms. This form of digitised knowledge divide further affects their freedom to use the mobile phone to empower themselves, further highlighting their limited capabilities as Sen (2005a: 5) argues. Issues of capabilities and gaps in knowledge were further highlighted by the use of the device between the old and the young. Those who were very old used the mobile phone mainly for calls and PCMBs. This shows that this group lacks the knowledge or ability to use other applications. For instance, the young group used applications such as Internet, Facebook and WhatsApp for reaching out to the world. Although the usage was not high as compared to the calling and SMS features, the exploration shows interest in the information economy. The different usages confirm what has been reported by others that age is also a determining factor in the use of ICTs. Of note is that the older people were mostly taught by younger ones on how to use certain features (Dyers 2014: 9).

The social divide, as noted by Krauss (2009: 29), was prevalent, evident from business case illustrated above to the low number of people who used WhatsApp for employment opportunities. The leadership group in support of its community's livelihood did not also have any mobile phone related platforms to announce employment and training opportunities. The knowledge gaps were also evident in the education group that did not know how the Mxit application could be used for learning purposes as seen the work of Butgereit et al (2010: 6). The use of Mxit in this community was actually very low, contradicting the forecast of Beger and Sinha (2012: 18). Such evidence shows the special digital divide between the urban and rural communities.

7.2.4 Freedom

Different community members use the mobile phone for various purposes that sometimes differ from one person to the other. As was highlighted in Chapter Six, section 6.4.2, it was used as a communication tool across all groups in the community. This section looks at the other usages deemed important by the community. Besides communication, the device served a purpose of learning through the use of the

Internet. The percentage of those who used the Internet for learning new things was slightly higher than those who used it for homework. Learning was at 59 per cent, showing great exposure introduced by this application; and on an educational level, the mobile phone benefiting both learners and those who are not enrolled in schools. This is a good start for the community as it shows that they are receptive to learning and exercising their freedom of their acquired capabilities (Sen 2005b: 5). Other beneficial things done through the mobile phone include the use of chat platforms to look for jobs, entertainment, and mobile banking to save on travel costs.

7.2.4.1 Usage

The findings of the research found that the educators were happy with possibilities that were brought by the mobile phone. The ability to communicate and facilitate lessons was of great importance to them. The mobile phone was regarded as being handy as it enabled educators to look up additional materials that they did not have in their textbooks. It helped with the illustrations of lesson materials that could not be depicted in textbooks. The educators were able to give better pictures of what is being taught through the support of the mobile phone. The dictionary function was used to also look up concepts that they did not know or understand. The reason it was favoured to be incorporated into the classroom was the ease of access to the Internet. Although the school had computers there was no access to the Internet due to cost issues (Chaputula 2012: 365). As a result, all the activities that required the Internet were accessed through the mobile phone. These results, however, contradicts the observations of Chaputula (2012: 367) who stated that accessing Internet through the mobile phones was equally expensive. The cost may be difficult to determine without extensive study of the cost of data bundles, equipment, and software.

The learners liked the convenience brought by the mobile phone in terms of helping them with their school work. They used the mobile phone to access the internet to complete their homework. The learners were, however; against the use of mobile phones in the classrooms as they believed that they will create disruptions. They still believed that the mobile phone may assist towards preparing for lessons and preferred that the preparations be done prior to the lessons so that in the classroom they can only share the extra knowledge deciphered from it. The use of mobile phones was already being viewed as a positive tool for learning with the only problem being that

the disruptions may disturb learning. Such remarks by learners further indicate their capability to take control of their value for learning. This corroborates reports on the learners' ability to evaluate their freedom in the learning process (Unterhalter 2003: 218).

The use of mobile phones for health purposes was non-existent in the community. The health workers believed in personal training instead of sending out messages. This is the group that had low interactions with the social networks and messaging services. The limited exposure to such applications may have an impact on how they perceive other means of sharing health information with patients. According to GSMA, the mobile phone offers increased easy access to health services at an affordable price (GSMA 2013: 10). Moreover, it improves capacity by enabling access to health expertise in areas with low access to health services. The findings of the Phake Rebone study are, however, in contradiction with this assertion due to the lack of capability to incorporate the mobile phone services to the clinic's health offerings. Although the PHBC used the mobile phone for health related matters, the interaction was limited to PCMBs to trigger communication only. Capabilities to fully utilise the device in this group was noted which further affected their freedom to explore other features to make the mobile phone more effective.

No gender related problems were picked up for those who were in business full time and those who were committed to the survivalist mode of trade. All the community members who participated in this study seemed to be free to do what they wanted to with their mobile phones except for the tight competition from the Somali and Pakistan business owners. As such, the findings from the literature as was observed by Hassanin (2009: 59) and IFC (2008: 14), see Chapter Two section 2.2.2, were not in sync with the community of Phake Rebone. The challenge of unfair competition, as was raised by entrepreneurs in this community, was the same for both men and women in the retail business sector.

7.2.4.2 Negative perceptions

The principle of freedom was used differently by people reached by this study. In as much as the mobile phone was applauded for making communications easier in this community, some were not fully in favour of the device. A number of learners had

negative perceptions towards the mobile phone. Their concerns were more on the safety threats that are related to it. They had the view that the mobile phone increases criminal activities related to theft, putting their lives in danger. The mobile phone was also seen to be contributing towards abuse due to callers who hide their identity and insult others. These concerns by learners are in line with what was reported in Chapter One, section 1.2.11, as the youth are the ones mostly exposed to misuse of the devices. It is actually normal for them to be conscious about the mobile phone so that they do not fall in the same trap of misuse as they owned the devices.

7.2.4.3 Eagerness to use mobile phones

The ownership and usage of the mobile phone was equally distributed in the community. Part of the lessons noted from the GEM framework (see Chapter Three, section 3.3.2) was that impact measurement studies should pay attention to the gender issues when assessing ICT usage. As such the aim was to aggregate the data by gender in order to differentiate usage per gender. However, the sample reached had a greater gender disparity. There were more females reached than males. The researched sample had a large number of female participants since some men were not willing to participate, somewhat congruous to Bailey's (2009: 7) research results. Nevertheless, both gender groups had 31 per cent of smartphone ownership. There was also a slight difference in ownership of the standard phone and feature phones. The observations on the interviewed and surveyed groups did not flag any difference in terms of the mobile phone usage. Both genders showed greater independence in using their devices. The interesting point in such gender discussions is normally the question of equal spending and access (Balboni 2010: 15, Narayan & Nerurkar 2006: 38, Yudhoyono et al 2013: 34). However, nothing awkward was noticed from the findings. The only noted difference was the confidence in usage between the two genders which may somehow be related with the males who did not want to participate in research but rather wanted their children or wives to take part. The gender stereotypes related to access and usage of the mobile phone were not eminent in the community. In section 2.4.4, the issue of affordability was raised to be perpetuating unequal access to ICTs. The household burdens carried by women meant that they did not have the liberty to spend their monies towards ICTs. The nature of the mobile phone is designed in such a way that first one buys a phone, then buys airtime or data to make calls and access social platforms. As a result, once there is ownership of the

device by both genders, only spending on airtime and data can be assessed. The use of services such as the PCMBs, making calls and sending SMS are valuable in establishing expenditure of airtime. A breakdown in gender usage of different features/applications is given in section 7.3 of this chapter.

The mobile phone was used for entertainment where games were played to escape boredom. The games are normally available in all mobile phone types but those who were not using games scored a slightly higher number. About 44 per cent of the community members were not playing games. Only 24 per cent of community members stated that they played games to entertain themselves. Those who played the games sometimes were at 31 per cent, with only 1 per cent not responding to the question. The interest in games seems to be less or it could be that the community does not like playing games especially on the mobile phone. Mobile phone games affect battery life so that could be one of the reasons they were not played more often. Community members with feature and smartphones used their devices for listening to music as part of entertaining themselves. The music was either downloaded from the Internet or it was shared via the Bluetooth of their devices. Another striking observation was that 53 per cent of the community members had not shared any content via their mobiles. Only 18 and 28 per cent had sometimes or always shared content respectively. This could be that a lot of sharing may be happening amongst the younger groups, which means that the elderly population is excused from these statistics.

7.2.4.4 Adaption in usage

The eagerness to use the mobile phone was extended into different ways of ensuring the device brought more value for their money. The trend of multiple SIM cards as reported in Chapter Six supported the findings of Boateng (2011: 57) and Esselaar et al (2010: 4). Similar reasons of network connectivity and affordable services were reported. A new trend noticed was that of utilising free calling services between similar networks and airtime advances. The airtime advance benefit was expanded by owing multiple SIMs of the same service provider. The users had adapted new ways of making the mobile phones services work for them. The ability to use various ways to maximise access to different service providers' benefits affirm Sen's (2005a: 4) point about freedom leading to functionings. Their capabilities did not only enable them to

use the mobile phone and its features but they were able to achieve extended value from their mobile phones.

7.2.5 Empowerment

The theme on empowerment looks into how the community at large has developed as a result of the interaction with the mobile phone. This is looked at from the individual community members to core groups that are a part of Phake Rebone. This is explored focusing on the learning activities that take place as well as information access.

7.2.5.1 Learning and research

The findings of the research found that the educators were happy with possibilities that were brought by the mobile phone. The ability to communicate and facilitate lessons was of great importance to them. The mobile phone was regarded as being handy as it enabled educators to look up additional materials that they did not have in their textbooks. It helped with the illustrations of lesson materials that could not be depicted in textbooks. The educators were able to give better pictures of what is being taught through the support of the mobile phone. The dictionary function was used to also look up concepts that they did not know or understand. The reason it was favoured to be incorporated into the classroom was the ease of access to the internet. Although the school had computers there was no access to the internet. As a result, all the activities that required the internet were accessed through the mobile phone. This conforms the literature findings that argued that these devices are important for education (Ngwenyama et al 2006: 8). The available computers however failed their function for empowering learners and educators as per the South African e-education policy (Department of Education 2004: 17, 20). The computers were inadequate and they lacked required services such as the internet and learning content to be beneficial for both learners and educators.

7.2.5.2 Information

Internet access remains instrumental in the classrooms for learners and educators to acquire new methods of learning. Convenience of accessing information is the driving factor. The information accessed through the Internet was regarded as recently updated as in-print books. A constant release of materials such as articles and electronic-books (e-books) is what makes the Internet to be favoured in terms of

new/updated information. It is through Internet access that the learners in the community are able to complete their school homework.

Other members in the community who have access used internet to learn new things and receive information that contributes to their overall happiness in life. For example, the story of Tryphina who used google to assist a friend who was struggling to get pregnant is one point of reference. They consulted Google. The results of the search advised the woman on how to calculate her ovulation days and use that to assist with conceiving. Tryphina's friend then fell pregnant after following the advice found on google. This supports Geana and Greiner (2011: 111) on their noted new trends regarding the internet and health findings.

7.2.6 Safety

The issues of safety and security form the important element of most communities, including this researched community. The results showed greater dependence on either the community social structures or the police to assist in cases where their safety is threatened. The mobile phone does play an important role in the safety of the community members. This confirms Infodev (2012: 28) and Macueve's (2009: 26) findings that reported a mobile phone improves the safety and security of its users. The mobile phone was used to call for help when there was a safety threat amongst some community members. Not only are the calls made to seek assistance but also the 'buzz' feature means of communication is used. This is done calling someone and dropping the call before they pick it up, it can be done several times to alert the person being called that there may be an emergency. The buzz enables the victim to send messages without alarming the intruders.

The presented results in Chapter Six show discrepancies in usage of the mobile phones. These are based on knowledge and access of various features or applications. The measurement aspect then comes out quite relevant for such a community that believes so much in the use of mobile phones. Its importance was less argued in this community. The correlations on this aspect deviated only on the learner group and the community groups. The four other groups unanimously agreed to the importance of the mobile phone. The divergent views expressed by those against the use of mobile phones were centred on issues of safety and etiquettes. These are

similar issues that were raised in Chapter One, section 1.2.10, where Weerakkody (2008: 459) argued that the way some people use the mobile phones makes it bad and this does not necessarily mean that the device itself is bad. The counter importance emanating from the community and learner groups is relevant in that it shows that a mobile phone is not taken as presented to some users. There are those who are aware of its pros and cons and such is necessary especially in developing the matrix. This will, to a certain extent, assist the researcher in making sure that the intended users can clearly realise the importance of such a matrix.

7.2.6.1 Emergency

The SMSs played an important role in issues of safety in the community of Phake Rebone. The first point of reaching out for help was through a mobile phone to alert neighbours. There was a correlation between those who always contacted the police and neighbours when in danger. These two variables both had 37 per cent of outreach. Expectations may be that the CPF group be the one with most reached results as they were described in Chapters Four and Six as the main points of contact for safety and security issues. In these results, however; that is not the case. The low percentage of the need to report issues to the CPF correlates with the initial results of the CPF group that they do not take complaints via the mobile phone. The 32 and 27 per cent of those who always and sometimes use the mobile phone to seek help was a little bit higher. The expectations would be for this number to be smaller on both accounts based on the reported low preference by the CPF committee to accept reporting calls. The trend was well received in the Rebone extension CPF which may have led to such a high number as they welcomed complaints reported by mobile phones.

The lives of people have evolved immensely whereby most people use mobile technology most of the time. As such, the mobile phone does not only connect people to each other but assists in maintaining contact whilst travelling. In cases of emergencies the same device can come in handy to inform family and friends. As such the community did not use the security passwords to restrict access to their devices. This was done to enable easy access to those who would be assisting in emergency situations to reach their loved ones. Others even use relational names to make sure that relevant people are reached when in emergencies. This shows the community's consciousness about their safety. It is also evident from their willingness to serve in

the CPF structures and supporting such structures. With all these structures in place the mobile also helps them to feel safe (Agüero et al 2014: 90).

7.2.6.2 Security

In as much as the mobile phone is helping in terms of enabling safety among its users, there are security concerns that comes with the device especially of privacy issues as raised by Pedro (2012: 316). Only a small number of the researched community raised security concerns about the device. The main concern of the security of mobile phones that came out strongly was the abuse directed to people through the use of the device, confirming the findings in Chapter One, section 1.2.10. They frowned upon those who were misusing the mobile phone to insult others. They expressed that it is through training that those who abuse the mobile phone can change their attitude towards such negative use of the device.

The next section discusses in detail the training needs of the Phake Rebone community.

7.2.7 Training

The use of mobile phones does not necessarily depend on any form of education. However, the effective use of the mobile phone does require some form of education or knowledge. International Telecommunication Union's (ITU) (2014b: 3) report affirms the findings, as they have stated that it is necessary to develop skills and knowledge on how to use ICTs to garner the social and economic development that could be achieved through effective usage. For example, applications such as WhatsApp, Facebook, Twitter and LinkedIn can be used by job seekers and businesses to market themselves or get information that may be of great assistance to them. The low prevalence of an application such as LinkedIn is an example of limited knowledge of its functions and importance. Through training issues of underutilisation and misuse may be curbed. The importance of training can be observed in Aker et al (2010: 3) research where training on mobile phones helped youth and adults in numeracy and literacy. They both increased their number recognition through dialling and improved on writing letters and syllables through texting (Aker et al 2010: 17).

7.2.7.1 Underutilisation

The health group were not using the mobile phone optimally to reach out to patients. As a result, the community, was not using the device much for health related matters. Other benefits of incorporating mobile phones into health matters include reducing in-person visits and greater adherence to treatment plans (GSMA 2013: 6). This was another area that could benefit this researched community. If we are to bring in the question of efficiency in the health group of this study, the outcome would be that mobile phone was not used efficiently by the concerned groups. The responses reveal that the users were not aware of how effective the mobile phone could be in terms of addressing the health needs of the community. Lack of knowledge therefore renders the device ineffective. As a result, both the health workers and patients need to be educated on the benefits of using the mobile phone for improved communication on health matters.

The CPF group was the lowest in terms of using the mobile for their activities. They depended mostly on in-person reporting of problems. The Phake Rebone team only used the mobile phone to gather its members when a case was reported. This was used occasionally as they would also walk to the members and inform them of the case at hand so that they could go together. The members are not located far from each other, hence the reliance on in-person gathering of members rather than calling. Where a call was made, it would be to the one who is living a little further away or if not found at their homes. The Rebone extension CPF team did not mind the mobile phone reporting of incidents. The team comprised mainly of the younger group hence, they were accommodating the mobile phone reporting system, thus supporting the views of Alampay (2006: 14). The community also showed interest in using the mobile phone to reach out to the CPF in cases of need. This suggests another set of training requirements for this group so that they can respond to the community's needs. The required training with these groups would be on extensive use of other platforms to relay complaints, especially, such as WhatsApp.

According to the Western Cape Community Policing (2003: 1-2), a safer community can be achieved through community policing where the police and community members work together to achieve their safety goal. The effective use of mobile platforms that allows easy and affordable access to CPF services may play a huge

role in terms of improving the communication between the community and those interested in its wellbeing. The involved teams will, however, require an induction as to how the applications can be used and managed especially in cases where pranks can be pulled.

Regarding community leadership, in assessing the effective usage of the available resources to them with regards to the mobile phone, it can be said that it was not used effectively. The interviews were conducted during the national campaigns for political elections, but the mobile phone as a tool was not exhausted in pushing the campaigns. When probed on this, the community leadership expressed the view that the mobile phone was not sufficient to explain to the voters why they needed to vote for them. They felt that the mobile phone would be limiting towards lobbying the community. The mobile phone was only deemed important for communicating other matters, not politics.

Even at a committee level, lobbying was only done in-person with the fear of leaving trails of evidence that may damage the involved groups. For example, they mentioned that if somebody was to use a mobile phone to lobby a person that the group had not agreed upon, when such communication is leaked, the member who initiated the counter lobby may be in trouble or be viewed as if they are trying to cause conflict in the leadership. The usage trends may also be as a result of limited knowledge on how the applications may be used for such political activities. This could also be linked to lack of awareness and confidence as observed by ITU (2014b: 39) as there are several ways that available platforms could have been used to support their outreach.

In as much as some learners liked the mobile phone and were happy to use it, others said it was not as important. Although they owned the mobile phones, they indicated that their parents are the ones who bought the devices. The parents thought that the mobile phone was good for their children. What this says is that the limited knowledge may be encouraging the noticed dislike. If other learners are using it for doing their homework, the question that needs to be asked is that how come others are not realising this benefit. The fear of trying out new features was also recorded in the interviews conducted. Users did not want to fiddle with mobile phones in case that could be detrimental to their devices. This was probably done to preserve their

devices, as they did not want to cause malfunction by playing around with features that they did not know how they work or may damage their mobile phones.

“Yes, I am afraid to use them because I might damage it or do things that would make my phone dysfunctional,” said (Mona).

7.2.7.2. Misuse

The misuse as was noted in section 7.2.6.2 does not only exist in people insulting others but disruptions caused especially in schools. The learners liked the convenience brought by the mobile in terms of helping them with their school work. They used the mobile phone to access the internet to complete their homework. The learners were, however, against the use of mobile phones in the classrooms as they believed that they would create disruptions. They still believed that the mobile phone may assist towards preparing for lessons and preferred that the preparations be done prior to the lessons so that in the classroom they can only share the extra knowledge deciphered from it. The use of mobile phones is already being viewed as a positive tool for learning with the only problem being that the disruptions may disturb learning. Some developments in ICT learning have introduced the geo-fencing concept that inhibits content that may cause disruptions in the classrooms.

According to Bender (2013: 1), geo-fence is an area or geographical location that has been virtually “fenced off”. The geo-fence enables and/or inhibits mobile phone users to access certain content in that fenced area or location. Some mobile applications intended for learners or educational environment install geo-fencing to ensure that the learners are not exposed to content that may cause disruptions or unease (Bender 2013: 3, Winkler 2014: 1). The article by Winkler reports on how Yik Yak used geo-fencing to protect middle and high school learners from cyber bullying in the school parameters. The geo-fence therefore protects learners from accessing content that is not relevant for them and prevents those that are targets of cyber bullying from receiving such content. They, however; emphasised that the learners will not be protected from such content in other public areas where learners meet (Winkler 2014: 1). With the geo-fencing technology, the educators’ needs to incorporate mobile phones into learning can become a reality. Learners will also not have problems of

other social platforms creeping into their learning environment. The issue of cost also is eminent in the installation of geo-fencing.

Other misuse issues at a community level relates to those of power and status. The use of mobile phones for power can be detrimental to its developmental goals. As noted by Carmody (2012: 6), the use of mobile phones at the expense of other pressing basic needs, for example, buying airtime rather than buying maize meal is indirectly linked to misuse of the device. When children sleep on an empty stomach whilst airtime has been purchased then the device is perpetuating poverty. A study conducted in Rwanda revealed that in the urban areas, the expenditure of food had declined whilst ICT expenses had increased, suggesting that the money needed for food was redirected to ICT related consumables. This was the case with the rural parts of Rwanda as well (Diga et al 2014: 172). Such expenditure for ICTs even when food expenses are cut, calls for concern of livelihood priorities. This study, however, did not have clear indicators on whether the use of the device was in any way affecting the family livelihoods. What was noted in as much as power is concerned, it was those using the device to abuse others through identity hidden calls. The use of vulgar language and rudeness displayed by callers with hidden identification was a cause of concern among the community members. The mobile phone is also used to earn social status of belonging. This is a dilemma, as now people would want to fit in instead of using money for more valuable things. The challenges with social status are that this then influences the type of device people need to own to fit into a particular group. This is one element that motivates theft and communities to purchase expensive devices from thugs, as they will be cheaper. As argued by Adera et al (2014: 14), the loss of these devices bring vulnerabilities to the lives of the people.

7.2.7.3 Training requirements

To optimally utilise mobile phones some form of training is required. As Meyer (2000: 142) has accurately observed, training is important in transferring information. In the case of this community training is necessary in cases where the mobile phone's value is unnoticed to make people aware of educational apps, online training, emergencies, and to enable them to read community news online and to apply for jobs. All these points received a great response with an average of over 270 people showing the need for such training. The value and importance will serve to educate the community

on features/applications that are not currently used. They will be taught on the advance use of the device to encourage positive attitudes towards the mobile phone so that those who are involved in the abuse of the device can understand the damage caused. The community will be presented with the best usages that have been observed already to also encourage others to follow suit. Although the findings reported that training is required for the elderly, training can be beneficial even to those who consider themselves digitally literate. Nie Fengying et al (2011: 130) asserts that if people are trained on how to use ICTs the effective use of these devices will increase in rural areas. The training on educational apps, online training, and improving one's lifestyle are topics that everyone can benefit from. The community can be exposed to online courses and skills that they can use to empower themselves. Educational material will assist both the learners and those who are still interested in learning new things.

The issue of illiteracy was mentioned quite often with the hope that something could be done about it. The issue of language used in mobile phones was viewed as a barrier for some of the people in using utilising the device. In some instances, one is required to understand English in order follow the instruction or transact in certain applications, for example the need for literacy requirement by MPaisa agents in Afghanistan (GSMA 2010: 33). The results are consistent with literature as the same challenge of illiteracy was noted by InfoDev (2012: 8) and Labelle (2005: 16). Digital illiteracy is a problem that does not only affect the illiterate but those who are literate as well (Kleine 2013: 74). The utilisation of a mobile requires skills and knowledge (Frempong & Braimah 2006: 32) which not all people might have. For example, there are those who cannot use features such as SMS, Internet and applications such as Facebook and WhatsApp. Digital/mobile phone literacy can therefore be introduced for the whole community not only to help the illiterate but also to provide additional learning for those who consider themselves capable. This approach will also assist in discouraging people to feel like there are those who are better than them, thereby bridging the social divide discussed in section 7.2.3.4.

The issue of language used in the manuals and instructions in the mobile phone require some attention by policy makers. Localising the devices to enable citizens to get instructions in their spoken language may be helpful. Although this may have cost

implications, policy makers need to work at it thoroughly to ensure that language barriers are lifted. The issue of localisation of the mobile phone language may be used as a vehicle to create employment. This would require translators who would be employed from the local community who speak the same language.

Already there are those who have started using the Internet to learn about fields of interest to them. Exposure to more learning and empowering material would go a long way. Online learning will assist them a great deal, and, if certification is available for some of the courses, it may be used later when looking for employment. The use of the mobile phone dictionary has already helped to improve vocabulary of one of the respondents; more community members can achieve this as well when they know how to use the dictionary on their devices. The community was also interested in receiving training on how to use their mobile phones to look for jobs. Those with devices that have access to Internet would then be able to use different platforms to market themselves and help fellow community members by informing them of the available positions. The other area that the community wanted training in was how to address the safety issue, to enable easy access during emergencies. They wanted to know how to save their contacts that should be reached during emergencies. They also wanted to receive community related news through their mobile phones.

The findings of the research revealed the importance of this device in the community of Phake Rebone. The community has intentions of continuing to use it in the future and are ready to learn more about this device, especially on how they can improve their wellbeing with it. What was noted as well is that in terms of development impact, the mobile phone only helps to a certain extent. However, given the fact that this community never had any form of communication tools prior to the emergence of mobile phone, this device has contributed immensely. The people are now able to call their friends and families anytime, anywhere. The mobile phone has allowed them to communicate to the external world, something that they were denied of during the FTL era. Although the core group did not really experience the developmental impact of incorporating the mobile phone into their day to day duties, this can be linked to a cost and capability issue. Of course the mobile phone requires money for it to do other services such as making calls, sending messages and accessing the Internet. Its importance in development should be acknowledged as it has become an essential

item for most household. The purchase of airtime has also moved into a necessity element, as the community, for instance, has realised that in cases of emergencies it is the mobile phone that will assist them in securing the help required. The knowledge that in times of great need a mobile phone will assist in saving a life; or enable someone to secure a job; or help someone in Mpumalanga to easily convey social messages to someone in Northern Cape says that a purpose of development of this device has been achieved. However, it will be great to add more development functions of the device as its use grows.

In response to the research problem there are no existing tools to measure the mobile's efficiency in the lives of its users. The matrix conceptualised in this study seeks to see how the effectiveness of the device can be measured. The next section discusses indicators that could be used to develop the matrix.

7.3 INDICATORS

In Chapter One, section 1.2.9 indicators were discussed as important elements that can be used towards measuring access and the use of any ICT related devices. It became apparent that for any measurement activities, they can be used in helping evaluators to do their assessment. What can be drawn from the findings of this study is that there is room for improvement in terms of ensuring that the mobile phone is used by members effectively. This cannot, however, be possible without laying the ground on which areas need to be supported and for what purpose. The community indicators will shed some light on areas of focus for the proposed matrix. The identified indicators will be presented based on the core groups studied and the entire community.

7.3.1 Community core groups' indicators

The learner group had two distinct users. The first group was mobile phone savvy whilst the other had not much interest in the device. The latter were concerned about the negative usage around the device and failed to focus on some of its positive aspects. In this group, the indicators can be drawn in such a way that both groups realise the underlying value as well as an emphasis of the mannerisms required for usage. Thus, the concerned group, (section 7.2.4.2) will realise that bad usage can be

inhibited if the perpetrators receive awareness and guidance on how to improve their conduct. The indicators for the learner group included learning, access to information, communication and access to content. The indicator on communication had the markers that said “talk and chat to people politely”. This already shows that any impolite way of engaging with the next person is not acceptable. When the user is measuring their own usage trends they will then realise that there is something that they are doing wrong in terms of communication if they receive a negative assessment.

Indicator	Marker	Capability
Learn	Progress in studies e.g. pass grades	Ability to complete the educational activities with the mobile phone
Access information	Have knowledge	Ability to acquire information that would contribute towards increasing knowledge
Communicate	Talk and chat to people politely	Relay messages and relate to people in a positive way
Access content	Load or use learning materials accessed from mobile devices e.g. dictionary	Ability to access different learning material through the mobile device

Table 7.1: Learners’ indicators

Source: Own

Table 7.1 sums up how the learners’ indicators can be formulated. The similar table can be used for the educators as they more or less have similar needs in terms of education. However, the markers and output can be presented in a manner that would suit the targeted group. For example, the access to content indicator has different markers in both the learner and educator tables. The variables that may be important for educators will be access to information, communication, access to educational content, training, and ICT empowerment, see Table 7.2. The latter is considered due to the reported reluctance to use ICTs in Refitlhile Primary School see Chapter Six,

section 6.3.5. According to Harindrath and Sein (2007: 8), empowerment is one of the variables to assess the impact of ICTs. Therefore, the mobile phone may be a tool that could enable this group to get used to ICTs that are accessible in it. In a later stage, such skills could be used in other mediums such as PCs. The indicators on access to information, communication and accessing content are kept standard for this educational group as they are relevant for both groups. They may also assist in curbing the identified technological gap that was reported in the schools.

Indicator	Marker	Capability
Access information	Have knowledge	Ability to acquire information that would contribute towards increasing knowledge
Communicate	Talk and chat to people politely	Relay messages and relate to people
Access content	Use other learning resources to support the curriculum content	Ability to access different learning material through the mobile phone
Training	Online learning	Ability to find features/ applications that will contribute towards personal growth
ICT empowerment	Improved ICT skills	Ability to use ICTs for purposes of educational related activities

Table 7.2: Educators' indicators

Source: Own

The health group's main purpose was to provide healthcare and health related support of the community. Their indicators are drawn such that they could continue to provide their service in an efficient manner though the mobile phone and related ICT services. The identified indicators are access to information, communication, education, support, training and empowerment. Table 7.7.3 below illustrates the related measurement aspect for these indicators.

Indicator	Marker	Capability
Access information	Have knowledge	Ability to acquire information that would contribute towards increasing knowledge
Communication	Talk politely to patients	Relay messages and relate to people
Education	Use SMS for educating patients	Ability to Send SMS and other related services to educate the patients
Support	Use of SMS and related services to interact with patients	Ability to use different platforms other than voice calls to provide support to patients
Training	Online learning	Ability to find features/ applications that will contribute towards personal growth
ICT empowerment	Improved ICT skills	Ability to use ICTs for purposes of health related activities

Table 7.3: Health workers indicators

Source: Own

The CPF group is the community's first point, in most cases, of contact in terms to security related issues. They also work closely with the police in criminal and other cases that tend to be difficult to resolve. They are then, on their daily duties, interacting with the community members and police officers. They also receive training to help gain knowledge on how to handle different complaints from the community. The indicators for this group include communication, safety, training, and ICT empowerment. The indicators and how they can be assessed are in Table 7.4 below. It should be noted that the CPF group comprised of the younger and elder group as such the elder group may not be responsive to indicators such as training and ICT empowerment. Therefore, these types of indicators may be excluded for this group or the most basic training should be introduced.

Indicator	Marker	Capability
Communication	Respond promptly	Ability to respond promptly to complaints raised through voice and messaging services

Indicator	Marker	Capability
Safety	Use SMS to update the community about safety issues and measures	Ability to reach out to the community through SMS and related services
Support	Use of SMS and related services to interact with community members	Ability to use different platforms other than voice calls to provide support to crime and abuse victims
Training	Online learning	Ability to find features/applications that will contribute towards personal growth
ICT empowerment	Improved ICT skills	Ability to use ICTs for purposes of supporting their daily activities

Table 7.4: CPF's indicators

Source: Own

The leadership group is responsible for leading the community and ensuring that services are provided. They are central in the community and they need to communicate to the community as well as receive feedback. In creating indicators for this group the opportunities that could be leveraged from the mobile phone were considered especially on various means of communication. The identified indicators included access to information, communication, community dialogues, training and empowerment. Refer to Table 7.5 below for an explanation of each indicator.

Indicator	Marker	Capability
Access to information	Use of internet, social networks to get information	Ability to use different platforms to access information related to politics that could be beneficial to their branch
Communication	Respond promptly	Ability to respond promptly to complaints raised through voice and messaging services
Community dialogues	Receive service delivery issues	Ability to receive service delivery complaints via different mobile phone platforms; Ability to use these platforms to ease or resolve reported issues.

Indicator	Marker	Capability
Training	Online learning	Ability to find features/ applications that will contribute towards personal growth
ICT empowerment	Improved ICT skills	Ability to use ICTs for purposes of supporting their daily activities

Table 7.5: Community leadership’s indicators

Source: Own

The identified indicators for the study’s core groups had some similarities, showing the interwoven nature of the role they play. Indicators such as information, communication, training and empowerment were in almost all groups. This shows the interrelatedness of this community’s activities and needs. Since the community group had a bigger group from the surveys, an indicator usage log has been formulated to further understand their activities. The next section discusses the usage and the indicators in detail.

7.3.2 Community indicator calculations

The indicators provide measurement yardsticks to be used for expected/unexpected results. The markers were used as variables that will give an indication as to whether a particular indicator could be measured and how so. For purposes of this study, commonly used features/applications were used for measurement. These features/applications were then measured on how they were used by the community. The usage was calculated by looking at the number of users, the number was then divided by the total targeted population and multiplied by 100 to get a percentage (ITU 2014b: 45). For example, an indicator such as sending SMS was chosen as it can be performed in all types of mobile phones. The cost of sending an SMS is lower compared to a phone call that makes relaying messages cheaper. For anyone to send these types of messages they need to at least have an airtime and some basic literacy of writing and knowledge on how to access such features. As such, the affordability and skills levels can be deduced from such results.

According to Comfort and Dada (2009:51), the SMS is in itself a barrier for access as it requires users to be literate. The results showed a minimal difference between the

usage between women and men in Phake Rebone. However, men seemed to prefer sending SMSs regularly compared to their female counterparts, see Table 7.6. Only 29 per cent of women sent SMSs regularly compared to men with 42 per cent. Therefore, it can be deduced that women were not as comfortable or able to send SMSs. The reason may be due to the knowledge on how to use such a feature or it could be that they did not sufficient airtime to send SMSs. In Comfort and Dada's (2009: 49) research it was reported that men were spending more money on airtime than women who spend their money on household essentials. This might be the case with the Phake Rebone's community but the nature of calls needs to be looked at to ascertain the affordability assumption. There were 48 versus 66 per cent of women who were making calls regularly, leaving men to be the ones making most calls regularly. The female group was the only one that had people who had never made calls. It is therefore evident that the reason behind limited SMS interactions by women has to do with affordability. Women opt to spend their money elsewhere than on sending SMSs and making calls. The literacy raised by Comfort and Dada above was partially unrelated to the researched community as they could even use WhatsApp. However, their facts may be true for those who did not use this feature at all.

Indicator		Female				Male			
		Regularly	Sometimes	Never	No answer	Regularly	Sometimes	Never	No answer
Send SMS		29	47	24	0	42	41	17	0
Send MMS		4	20	76	0	3	23	74	0
Make calls		48	48	4	0	66	34	0	0
Use WhatsApp		25	6	69	0	25	3	68	0
Use Facebook		20	14	66	0	20	22	58	0
Use Internet	Surf	18	21	61	0	28	32	40	0
	Learn	12	23	65	0	19	32	48	0
	Homework	6	19	75	0	8	25	67	0
	Search for jobs	8	15	77	0	10	10	80	0
	Market my skills	6	16	78	0	5	11	84	0
Download content	Games	6	15	78	1	17	24	58	1
	Videos	10	27	63	0	22	25	52	1

Table 7.6: Community indicator usage log

Source: Own

7.3.2.1 Time spent on applications

Since WhatsApp and Facebook were reported to be the most used applications in the community, their usage was also calculated to understand their impact. The results were roughly the same between men and women with a slight difference of about two per cent on average. The only noted difference was on the use of Facebook where in the interval of ‘sometimes’ males scored 22 per cent whilst women scored 14 per cent, refer to Table 7.6 above. A similar trend was noted on WhatsApp where females outnumbered males with three per cent on the interval of ‘sometimes’. There were some features and applications that were not used by the community. There was generally a low frequent usage of multimedia messaging (MMS), using the internet for school homework and marketing their skills over the internet. These indicators scored below ten per cent of the regular use denominator for females. The male group had higher scores on the indicator of downloading content. Their score was higher on both the downloading of games and videos.

The community indicator usage log shows the different uses of mobile phones services. These shows that the markers proposed in Tables 7.1 to 7.5 are practical and with training as the underlying indicator they can be achieved. Since there was an element of similarity amongst the indicators in section 7.3.1, the community indicator table shall comprise of such indicators. Here’s Table 7.7 with extraction of the indicators from the core group.

Indicator	Marker	Capability
Access to information	Use internet, social networks, and messaging services to get information	Ability to use different platforms to access information related to jobs, education, health matters, safety and security, and politics
Communication	Talk and chat to people politely	Relay messages and relate to people
Community dialogues	Send and receive service delivery issues	Ability to receive service delivery complaints via different mobile phone platforms; Ability to engage community leaders on

Indicator	Marker	Capability
		community pressing issues using these platforms
Training	Online learning	Ability to find features/ applications that will contribute towards personal growth
ICT empowerment	Improved ICT skills	Ability to use ICTs for purposes of supporting their personal development

Table 7.7: Community’s indicators

Source: Own

7.4 THE PROPOSED MATRIX

A matrix is proposed in this study to assist in measuring the impact of mobile phones in rural communities. The use of the mobile phone and its related ICT services require some skills as they are knowledge intensive (Frempong & Braimah 2006: 32). Therefore, not everyone will be able to use all the features and download some features in their mobile phones. The reported under-usage by most groups in the community is linked to limited digital skills. Effective use of the mobile phone may not be possible without the knowledge and skills. ITU (2014b: 39) is in agreement with this study’s inference as they have also reported that lack of ability and opportunities are some of the causes of limited use of ICTs . As such, the purpose of this matrix is to highlight access and skills that require enhancement. This matrix will enable users to track the skills that they develop through the use of a mobile phone. In developing a matrix that will measure the usage of mobile phones, indicators are required to facilitate this. The identified indicator categories for the proposed matrix are listed below:

- Communication;
- Accessing information;
- Community dialogues; and
- Training.

In developing the matrix, the indicators identified in sections 2.4.1 and 7.3.2 were considered so that they can direct the researcher in articulating issues closer to the

community's hearts. The proposed matrix is can be customised according to the users' needs and the indicators and markers can be amended accordingly. The matrix illustrated in Table 7.8 had various columns and rows to create matrices. The columns were used to guide the users in terms of what they may want to do with a specific indicator. The guiding columns had markers, access, know how, need to learn and development impact. Markers were already explained in section 7.3.2 that they show an indicator can be measured. Access has been included to this matrix given the fact that not all users will have required resources to use certain features/applications. There is also a need to establish if people know how to use certain features/application and are willing to learn or improve their knowledge on such. These last three variables are integral in establishing development barriers. Lack of development will therefore not be blamed on the wrong things, be it people themselves or devices. The last measure is development impact. This is desired, expected and/or unexpected. In evaluating these measurements, the following symbols are used:

×: No

✓: Yes

_: Negative

+: Positive

NA: Not applicable

The matrices of the matrix are explained through cases of users resembling the profiles of the community members in Phake Rebone community. The users are given names such as "User 1" so as to distinguish their differences. Each indicator is explained with a different case to illustrate how different aspects can be recorded. The development impact is the final evaluation that confirms if there was a positive or negative impact. The positive evaluation can be used to draw a skills record extracting the key skills required towards a successful indicator. Below is the explanation of how the matrix is compiled per category.

Information Indicator

User 1: In the example used below, the user owns a device that has access to the Internet. It is a woman who does not have the powers to use services such as the Internet because of her household commitments.

User 2: The health care matrices are about a young woman with access to Internet and can freely spend her money to even buy data for the internet. She is therefore subscribed to various applications including bulletins. She also believes that there is still more that she can learn from her mobile phone and its applications.

User 3: The educational user does not have access to the internet and has decision making powers. He doesn't know how to access resources that would enable him to assist his daughter with homework. He is, however, willing to learn once he has a mobile phone that has access to the Internet.

User 4: The employment user does not have access to the internet but has decision making powers. She cannot place her CV online but does make calls to enquire about employment opportunities. She thinks she will be able to use the Internet once she has access and does not think there is a need for her to learn how to use mobile phone related platforms.

Communication Indicator

User 5: The user did not own a mobile phone and therefore the first three columns were not applicable to him. His parents have promised to buy him a mobile when he passes his grades and he is looking forward to learn about the different things that the device could do.

User 6: The user has a mobile phone that allows her to send emails and she has been applying through it. She has the power to make her own decisions on using her mobile phone. She also believes that there will be a lot of applications that she still needs to learn about to increase her knowledge.

Community dialogue

User 7: The user does have access to an SMS service and can make her own decisions regarding when and to whom SMSs can be sent. She, however, does not

know how write or send SMSs. As a result the development impact is therefore negative for her as the existing SMS feature fails to empower her in participating on digital community activities. She is also unable to communicate her safety issues to the CPF group.

User 8: The user has access to applications such as WhatsApp. However, he doesn't have the power to make decisions, meaning he cannot access this application anytime he wishes because the mobile phone is shared with his mother. He likes the community WhatsApp group platform as he can report any issues there. For example, when there are no meals from the feeding programme he can send the message to the community leadership with the permission of his mother.

Training

User 9: The training prospects for this user were not possible due to lack of knowledge on how to access such materials. He also did not see the importance of learning other applications on his smartphone. In terms of this indicator, the development impact was not possible and therefore negative.

User 10: The user is a business lady, who, through the assistance of her children, has been learning how to use Facebook. She has now created a business profile where she intends to promote her business to the community of Phake Rebone and the neighbouring villages. The development impact is positive as User 10 can now reach more potential customers.

The development impact shows that only when the certain need is achieved that impact can be evident. The impact of mobile phone for development can therefore be measured using the required development needs of a particular community and individuals. The matrix above shows that basic things such as sending SMS or making calls can be used to see if the users are experiencing the value of the devices that they have acquired with their hard earned money. However, the power to make decisions on the use of the mobile phone is essential. The absence of such powers may be linked to finances, relying on other people's devices and other gender related issues. The latter is possible in cases where, for instance, spouses feel that social networks such as Facebook are not good due to their ability to connect their loved ones with people they have never met. The concern of Paul in Chapter Six is one of

the examples see section 6.5. This proves that the effective use of the mobile phone is dependent on many aspects.

Indicator		Marker	Access	Decision making power	Know how	Need to learn/improve	Development impact
Information	General information	Read news online	✓	x	x	✓	-
	Health care and wellness	Subscribe to free health bulletins	✓	✓	✓	✓	+
	Educational	Internet to assist with homework	x	✓	x	✓	-
	Employment	Subscribe to placing organisations to get job alerts	x	✓	✓	x	+
Communication	SMS, WhatsApp, Facebook, etc.	Chat with friends on WhatsApp	NA	NA	NA	✓	-
	Use email to send CV for	Send CV to apply for jobs	✓	✓	✓	✓	+

Indicator		Marker	Access	Decision making power	Know how	Need to learn/improve	Development impact
	advertised jobs						
Community dialogues	Inform the CPF when in danger	Send SMS	✓	✓	x	✓	-
	Raise service delivery concerns with leaders	Send/receive messages on WhatsApp group	✓	x	✓	x	+
Training	Online training	Enrol courses online	✓	✓	x	x	-
	Self- learning	Creating a business profile on Facebook	✓	✓	✓	✓	+

Table 7.8: Mobile phone matrix

Source: Own

The mobile phone, particularly the smartphone, is in itself computational (Developer Economics 2013: 17) and the advanced use of it may enable users to accumulate ICT skills. The advanced use would refer to personal and professional use of SNS, using the office related packages, Internet for research, applying for jobs, note keeping, and ease of navigation on various applications and features. The University of Cambridge¹⁷ has categorised the use of word processing, spreadsheet, Internet and email as part of computer literacy skills. Therefore, the usage of the aforementioned applications can be used to formulate a skills database of the user that can be calculated by the matrix. The mobile phone matrix does not only show how the impact of mobile phones can be measured but also provides a basis for skills tracking. It can be achieved by taking the development impact inputs and mapping them back to the skills related to the outcome of the impact.

For example, under information, there are two positive impacts that could be used to illustrate how the skills table can be drawn. The health care and awareness indicator has subscription to health bulletins. For one to be subscribed to the bulletins we can assume that the following skills will be required: reading skills as the user should be able to read instructions on how to complete the subscription; writing skills: to complete the form; and ability to pay attention to detail as the form was completed correctly. In communication, User 6 used the email to send out job applications. The skills that can be drawn from this are as follows: writing, reading, ability to use the Internet, download applications, and create an email account to send emails. These skills are beneficial in some of the job requirements; refer to secretarial post¹⁸ for similar skills. User 8 uses the community WhatsApp group to interact with the leadership. In these interactions he can learn interpersonal skills and improve his reading and writing skills. Table 7.9 below illustrates the skills tabulation based on the indicator, its development impact and the skills used and that could be learned or improved.

¹⁷ More information on the classification of skills: <http://www.hps.cam.ac.uk/students/skills.html>

¹⁸ The skill required for a secretarial position: http://www.justthejob.co.za/info_jobid_32298971.html?utm_source=Indeed&utm_medium=organic&utm_campaign=Indeed

Indicator	Development impact	Skills
Information	Positive	Reading, writing, internet, and attention to detail
Communication	Positive	Reading, writing, internet, download application, email, and accessing files
Community dialogues	Positive	Reading, writing, and interpersonal

Table 7.9: Skills log

Source: Own

7.4.1 Testing the matrix

Upon developing the matrix, it was taken back to the community to assess whether the community would want to use such a means of measurement. The matrix design was taken to the community as a decision was made earlier in this study (Chapter One, section 1.2.2) that a participatory approach will be followed. This was to ensure that the matrix would reflect the needs of the community and not those of the researcher (Ukaga & Maser 2004: 13). A number of five people were interviewed from the community group. Three of them were previously interviewed and surveyed whilst the other two were being exposed to this research for the first time. The paper prototype was discussed with the individual group members to identify if they understood the matrix purpose, if it needed to be improved and if they would use it. According to Getahum (2001: 117), when community members are participating in development projects they can be part of decisions, implementations and evaluations. The community responses corroborate what other researchers are saying. The matrix was welcomed with a few changes. It was suggested that under the information indicator, general learning should be added as that is what is used for learning for those who are not enrolled in educational institutions. This was a fair suggestion and the ability to make amendments (see section 7.4 above) to the matrix were proved a necessity. The second one was to add an employment profile under the training indicator showing their value on livelihoods. Lastly, it was believed that the matrix would be valuable if it could encompass a career guide element to help those in schools or who have just completed their Grade 12. This feature could be linked to the employment indicator and training needs.

The main comments were that the matrix will be valuable only if training can be provided on how to use it or design it a way that makes it more intuitive. The users can set the indicators so that they can get reports on what is important to them rather than having the detailed matrix like the one discussed. The users also wanted to choose the markers that are applicable to them, for instance, choosing to be assessed only on WhatsApp than on SMS. The matrix should be in the mobile phone and use the reports assessment to help the user on how to improve on negative feedback. They wanted it to be in a form of an application that should be free of cost. The matrix should also have training modules. One respondent gave an example of the training indicator whereby she needed the matrix to guide her how to make online job application covering the following aspects:

1. how to open job advertisements;
2. how to respond to an advert and apply; and
3. how will they (prospective employees) respond to me.

The matrix should be able to prompt the user for attendance on courses he/she is interested in.

The inclusion of the community members in testing the idea of an evaluation tool and their feedback on the paper prototype was helpful. It confirmed the DFID statement that people are at the centre of development (DFID 1999: 3). The valuable community input disputed some of the views that communities need to have knowledge to participate effectively in development (Monakhisi 2008: 97). The fact that community members are the ones who would be using the matrix makes them the experts as they know better what would work for them.

7.4.2 Using the matrix

The noted limitation was that it seemed as if the matrix would be effective if it is embedded within the users' device. During the testing, it became clear that a paper format will make it tedious and difficult to track the users' interactions with different applications. An application will be a sensible, effective manner of using this matrix to track different activities automatically or manually. The application can send reminders to the users to take the application usage tracker and provide the user with a report every week or month depending on the users' settings. As evident from the work of

Aker et al (2010: 17), it was proven that learning occurring over the mobile phone can be tracked.

The social intervention of the device as discussed in Chapter Five was evident in the community. The use of the mobile phone to inform neighbours about security intrusion and possible attacks shows how the device is not just a tool to communicate. It uses the communication capabilities to increase safety and for people to feel secured. There, were however, noted ineffectiveness in its usage as far as employment is concerned. The results revealed that the mobile phone was not used sufficiently to curb the noted high unemployment in the community. This non usage of other application for employment was linked to lack of lack of knowledge. Modern technology sometimes fails to achieve its developmental role because the community cannot optimally utilise them (Mascarenhas 2014a: 241). The similar trend was noticed in the study of Mascarenhas (2014b: 152) where small businesses in Tanzania were given airtime for their business with the intention to help them grow. Their results showed that those who used up all the airtime managed to grow and progressed out of poverty whilst those who did not use the supplied airtime remained at the level that the intervention found them. It is with such observations that the matrix is developed for individuals to tap into features/applications that can empower themselves and their communities. The proposed matrix would therefore assist the community to realise different benefits that can be leveraged from their mobile phones. It will prompt them on how different applications and services (like the internet) can be used to maximise access to employment opportunities. The user's profile will be used by the matrix to determine the things that it needs to support the user with. For instance, if the user is looking for employment, this indicator will be used by the matrix to guide the user to applications used in order to receive alerts and view different job posts. Applications such as LinkedIn will be suggested to the user so that they can market themselves and receive job alerts relevant to them. According to Jiyane et al (2013: 3), the mobile phone can be used to share available job opportunities and this makes it an efficient advertising tool. When one user receives job alerts, they can then share this with other people in the community and other circles within the rural contexts.

The matrix can also be used for those who are business-orientated to support their small business, by exposing them to information that could help them with daily

operations. It can assist them with reminders and alerts for them and their clients on business matters. In response to a challenge that was noted regarding a kindergarten transporter who had to wait for children to be ready, alerts can be sent to parents to notify that the transport will arrive at a certain time to encourage parents to prepare their children on time. This way the parent cannot have an excuse as to their children not being ready. Alternatively, the parent can respond to the alert to inform the driver that they need extra time. The driver can then use this to re-plan his route to ensure that his time is not wasted waiting at the gate of a child who is running late. Traders can use the matrix to plan their stocktaking and it can alert them on when to do the next stocktaking depending on the information provided by the owner. Orders can be placed over the phone and be delivered which means traders can spend more time minding the business. With such little support the businesses can be more efficient and grow enough to employ community members. As such, poverty and reliance on social grants will be reduced as people would be able to take care of themselves.

Regarding the issue of poverty, it can be argued that the mobile phone has already helped the community. Travelling to report family or crime issues has been decreased as important messages are relayed over the mobile phone. This means that the money that was used for transport has now being channelled to other basic necessities within households. Those with bank accounts are also able to access banking from the comfort of their homes, saving them transactional costs and the dangers of commuting with cash. However, more is still required as the community lacks sustainable ways of earning an income. As a result, most people, especially the youth, are aspiring to relocate to urban areas in search for employment opportunities. The daily commuting is only done by the elders as they have binding family commitments. It is therefore envisaged that through this matrix, people can remain in the rural communities and be able to earn an income. This however, cannot only be achieved by the support provided by the matrix but national policies that would make rural communities attractive to live in. By opening avenues for people to be employed in these communities and money to circulate in the community would decrease urban migration. As reported by the STATSSA (2012a: 20), provinces with the biggest economic activities attracts migrants from rural communities.

7.4.3 Training for effective use

The researched group showed signs of underutilisation of the mobile phone. It was evident from the results that they lacked knowledge of various applications and features on how they can support them. It is cited that training targeted for community development need not be technical especially if it is ICT related. The training should be conducted in a manner that will enable participants to be creative, improve social skills and their self-confidence (Hautekeur 2008: 210). As a result they will not only get digital skills but other skills that can contribute towards them securing a job.

The use of the mobile phone to train and enhance people's digital skills is not new. The use of smartphone apps have been noted to be used by physicians in their training for medical references (Franko & Tirrell 2012: 3137). In Liberia for instance, the training of trainers (TOT) model was used to train traditional midwives on how to gather data from the pregnant women in remote rural parts using the SMS feature (Lori et al 2012: 4). Moreover the TOT master trainers (champions) were later the ones conducting training in their own rural communities and working closely with clinics. The pre and post-tests were used to assess the skills acquired by those trained by the community champion (Lori et al 2012: 5).

The Liberia case shows how a formal training session where a standardised training document, mobile phone's graphic designs and SMS were used to deliver training (Lori et al 2012: 4). The use of SMS and pictures to conduct training with mobile phones has also been used in Finland amongst teachers and students (Seppälä & Alamäki 2003: 332). This approach will no doubt be relevant in the community of Phake Rebone. However, it will be necessary to provide training workshops where the community is taught about the use of mobile phones, its benefits, and disadvantages as well as how it can be used to improve their livelihood. Stemming from this knowledge the community can then be trained on using the matrix which will be embedded on their mobile phones and how it can be harnessed to address their livelihood needs. According to Ally (2009: 2), training material should be packed in an accessible manner whereby people can have access from the comfort of their homes as well as on their mobile phones.

Mobile phones should be used to manage health issues within the community, particularly the PHBC and the clinic (GSMA 2013: 10). These could be used on health updates, alerts and notifications on the availability of medication. The Phake clinic health workers mentioned that they offer health education, therefore training notices can be send via the SMS and be loaded to the matrix. Those who do not want to attend training can still receive similar educational content over their mobile phones wherever they are.

According to Attewell (2005: 5), upon training completion it is necessary to have a needs analysis of participants as the mobile literacy and confidence differs amongst people. In order to maximise the usage of the mobile phones in this community, the trainer will have to identify other training needs in addition to those identified by individual participants. This can be a gradual exercise whereby when new skills are gained, new digital goals can be identified. Community based organisation can come in handy in providing training and support on the effective use of mobile phones.

7.5 GUIDELINES FOR USING THE MATRIX

The purpose of the matrix was to enable development practitioners, policy makers and ICT4D organisations to have alternative tools to measure the impact of ICTs and its related technologies. The matrix in section 7.4 is not conclusive and it can be adapted to add more variables that users deem fit for their evaluation purposes. In using the matrix, it may be important to consider the following guidelines:

- The first thing to do is to identify a target.
- It is important to understand the needs of the targeted group. Understanding the needs will assist in determining indicators that are relevant to the targeted groups and doing appropriate measurements.
- Since gender is central to ICT related activities (ITU 2014: 70), it is important to ensure that it is addressed in the assessment variables.
- In order to effectively measure the impact, identify markers that will guide in making sure that a certain indicator is measurable or not.

- As pointed out earlier (refer to section 7.3.2) do not only look for the expected outcomes only but also be in the lookout for those unexpected ones. The example of the second user in the communication indicator in section 7.4 is a point of reference.
- The columns can be used to add any variables that are deemed important to facilitate the evaluation.
- The negative outcome of indicators should be used to inform training and awareness to the targeted group in order for empowerment of ICTs to be exercised.

7.6 CONCLUSION

Mobile phones have proved to have helped the community of Phake Rebone to experience telecommunications' development impacts. The findings showed a general acceptance and usage of the mobile phone. It was used mainly for voice call communications. The use of smartphones led to some use of social networks like Facebook and messaging platforms like WhatsApp. The PCMs is still dominant to trigger voice calls and to convey some messages through the personalisation available with this application. The use of the mobile phone in education was recorded, whereby learners used it to access the Internet for homework. Generally, the mobile phone was welcomed for learning and learners emphasised that it needs to be used in a way that will not cause interferences with the actual learning. Educators used it to plan their lessons and there was an interest in accommodating it in the classrooms. The business, CPF, leadership and health sectors only used it for voice and PCMBs. There were no other activities due to limited knowledge on how it can be used effectively. The effective use of the device could have helped health workers and patients, especially in reducing the instance where people visit the clinic unnecessarily. The developmental impact of the mobile phone was noted by both the young and the elderly. Although the community was aware that they have not all claimed the benefits that comes with the device, they were keen on receiving training to further improve their interaction with the mobile phone.

The use of mobile phones has the possibility to be improved. The results suggest that training is required to enable increased efficiency of the mobile phone. The community also showed interest in receiving training that would empower towards a more effective use of the mobile phone. The issue of measurement was proved to be necessary as only through measurement could impact be clearly evaluated. The core groups in the community lacked knowledge and proactivity in using the mobile phone to support their daily duties except voice calls. With a community that is willing to embrace different opportunities that could be brought on by the mobile phone, this deterred efficiency. However, this was another outcry for the development of a tool such as a matrix to evaluate the community's weaknesses and strengths whilst helping them to keep tabs on the skills that they acquire with each use of certain feature/application. The matrix proposed in 7.4 and the supporting guidelines can be used to measure not only mobile phone effectiveness but also other ICTs. The developed matrix was deemed valuable by community group who evaluated it. Emphasis was made on making it customisable to suit each user's needs. The next chapter concludes the dissertation by looking at the research questions and objectives of the study if they were met.

CHAPTER EIGHT

8. CONCLUSIONS AND RECOMMENDATIONS

8.1 INTRODUCTION

The prevalence of mobile phones in most communities, particularly in rural areas, spurred interest in looking at ways of measuring their impact. In researching this measurement aspect, it was important to formulate the research question as well as the objectives that would guide the researcher in answering the research problem of the study. This chapter therefore looks at how the study was conducted and whether the measurement aspect was answered by the study. This is achieved by firstly reposing the research questions and answering them based on how they were answered by different chapters of the study. The last two research questions will be addressed with the research objectives to provide accounts of how the matrix was developed.

The next section will provide the summary of results based on the review of research questions. The summary of the study is then followed by the contributions of the dissertation. The concluding remarks are provided followed by recommendations and possible future research opportunities.

8.2 SUMMARY OF RESULTS

Prior to reflecting on the study's research questions and objectives, it is important to share how the study was put together in leading to the structure that both the findings of the literature review and fieldwork suggested. Since the study was going to be based on a specific community, it was important to understand the community's profile (refer to Chapter One, section 12.1). In so doing, it was found that each community has certain elements and figures that contribute towards its being. There were different people and activities that form an integral part of the community. As a result, the learners, educators, CPF, community leadership, health workers, businesses and community members were the ones that made up the ecosystem of Phake Rebone. The research was therefore designed in a way that would enable the researcher to

understand these seven groups as well as the different ways (in any) in which the mobile phone impacted their lives. The issue of gender could not be excluded from the research given its importance in communities and development. The research work of Davids et al (2009: 41) and Balboni (2010: 15) had already indicated that the wellbeing of people and unequal digital access were caused by existing gender stereotypes.

The summary of the study results is presented in the next subsection in reference to the research questions and objectives set for the study.

8.2.1 Mobile phone evaluation criteria

In order to understand if there were any measurement criterions out there to measure the impact of mobile phones, a research question was formulated to address this.

The posed research question was as follows:

What are the evaluation criteria for measuring the impact of mobile phones in rural communities?

In answering this question, the introductory chapter looked at the measurement tools. It was noted that although frameworks and models existed, they focused on ICTs in a general manner. The value of mobile phones has been measured by looking at its ability to enable users to do things that they could not do prior to having the device. In Chapter Two, sections 2.3.5 and 2.4.1, accounts were given of how the mobile phone helped learners to learn English in India, China, Bangladesh, South Korea and Indonesia (McKinsey and Company 2012: 4). The mobile phone enabled some community members, access to affordable messaging applications and SNSs where users could do various social activities (Beger & Sinha 2012: 18, InfoDev 2012: 30). In addition, banking services have been brought at the users' palms through mobile banking.

The mobile phone's significance in those involved in businesses was that it enabled them to communicate, promote their businesses and advertise their products and services through the use of SMS, messaging platforms and SNS (Boateng 2011: 50, 52, InfoDev 2012: 35). The other valuable aspect of the mobile phone was its contribution to people's safety and security. The literature does highlight different

things that can be used to evaluate the impact of mobile phones. Of interest to our study was Qxulwana's research, which also focused on the use of mobile phones in rural communities but did not conclusively provide its impact, see Chapter One section 1.2.3. The findings of the community of Phake Rebone were also in agreement with the literature findings. However, some of the identified groups did not have any other advanced usages besides voice communication that seemed to impact their way of doing things. For example, the health workers, community leadership, CPF and business groups had activities that could be facilitated by the mobile phone but were not used. Some of them knew the platforms such as SNS could be used to support their daily activities but they lacked the knowledge on how to do that. The evaluation criteria seem to be based on the benefits of the researched device.

The next subsection addresses the measurement criteria for the impacts of mobile devices.

8.2.2 Mobile phone measurement criteria for impact

Upon understanding the evaluation criteria for measuring impact, it was important to get clarity on existing measurements that are used for impact, this time focusing on actual frameworks. The following question was posed to direct the research:

What are the current measurement criteria for the impact of mobile phones in rural communities?

The literature was consulted to find out if there are measurement criteria for measuring mobile phone impacts. Only two suitable measurement criteria were found. Boateng's framework was developed for measuring impact on the transactional costs and benefits of mobile phone. However, his focus was only businesses. This was relevant, given the business element in Phake Rebone's community's composition. His conceptual framework proved that the targeted sample did reap the benefits of transacting through the support of a mobile phone. Of importance is the pre-knowledge (Boateng 2011: 55) that made all things possible, something lacked by the Rebone business group. Amartya Sen's (2005b: 35) capability approach framework was one of the measurement tools for impact. The capability approach allows the user to use the framework in a way that would be applicable to them. As a result, CA was

consulted in this study to formulate the questionnaires and surveys to determine people's ability to do the things. The discussion of results chapter further showed how the capabilities let to freedom of choices where usage of some applications and adaptations of services was concerned. That highlighted the development aspect as the community were using the mobile phone in a manner that was benefiting them. The opposite was also observed where people could not exercise their freedom to use some applications as a results of poor infrastructure that let to both communication breakdown and limited access to Internet services. As a results the desired functionings that enables possibilities of enhanced livelihoods could not be met.

8.2.3 Rural development impact assessment

The last measurement question was focusing on all the measurement tools that are out there for the evaluation of all ICT devices and related technologies and the question was posed as follows:

What are the monitoring tools for impact assessment of rural development?

In Chapter Three, section 3.3 different measurement tools that are aimed at measuring the impact of ICTs were discussed. Although there were few tools to measure the use and impact of mobile phones some frameworks namely CA, qualitative and quantitative methods were identified to be suitable for adaptation for similar activity. Other existing measurement approaches were mainly on institutional project activities. This was a good start in terms of measuring impact although this led to measurement of only the period that the institution was still active in a targeted community. Thus, as soon as the project was completed and the institution pulls away from the community, the monitoring also stopped. The post stage as referred to by Blind (2004: 30) is in most cases not conducted or conducted immediately after the project cycle stops. As a result, the measurable impact that takes place for instance a year later is not captured (see Chapter Three, section 3.3). A continuous measurement effort was thus missing from existing measurement criterions.

The next section discusses the impact of mobile phones in rural communities.

8.2.4 Mobile phone impact in rural areas

The first subsection (8.2.1) indicated that the criterion to be used in measuring the impact of mobile phones was looking at how they are transforming the involved users. This section digs deeper into the impacts of mobile phones in rural communities. In doing so the following research question was asked:

How are mobile phones improving the lives of the people in rural areas?

The findings revealed that people's lives were better because they could communicate with their friends and loved ones whilst saving on cost and travel time. Other small businesses saw increases in their profits due to transacting over the mobile phone, also saving immensely in travel and time costs (Boateng 2011: 56, Macueve et al 2009: 26, Munyua 2009: 126). The similar impact on saving time and travel costs was noticed only in the community group of Phake Rebone. The business group only used it for requesting stock and contacting clients. The minimal use of the mobile can be equated to that of Hassanin's (2009: 58) case study in Egypt where the business people could not use the mobile phone to market their products and services. Lack of knowledge on how the mobile phone can further support their businesses limits the effectiveness of this device. This shows that the perceived benefits cannot be experienced by everyone if there are knowledge gaps. Limited knowledge therefore limits the developmental impact of devices such as mobile phones as full benefits can only be realised with guided support. The researched community was not only using the mobile phone for communication purposes but it was also a vehicle for some of the community members to access the Internet. Chapters Six and Seven reports various interactions with device with reference to different groups in the community. Some members in the community used applications such as the Internet to learn about new things (Meena & Rusumbi 2009: 200) and help resolve health related issues through the advice from Google. However, the Internet could have been used more robustly, especially for employment purposes, since the community has a high number of unemployment. This application could have been used to search for employment opportunities. It should also be noted that low usage of the Internet for employment purposes could have been affected by the cost element and poor network connectivity. Access to the internet requires data which comes at a cost, and loading/running this application cost more than the light weight applications like WhatsApp and Facebook.

The reported unstable network services is also detrimental to the reliable connection to internet and can deplete data. The use of the mobile phone to support educational activities such as accessing learning materials and conducting research was observed in community members, learner and educational groups. Messages about weddings, births and deaths of friends and families are easily relayed through the device at a lower cost. Services such as banking, electricity, and airtime can be conveniently carried out over the mobile phone.

There was a noticed preference of using mobile phones than PCs in the schools (InfoDev 2012: 34). Although finances were cited as a challenging for operating the computers, other research proved that more people are doing their online activities over the mobile phone, see Chapter Seven, section 7.2.2.2 paragraph 3. This shows a shift in people's lifestyles and convenience brought by mobile phones. So even if people are out of their offices they still have the flexibility of accessing their emails.

8.2.5 Ensuring mobile phone efficiency

The ability to ensure the efficiency of the mobile phones was addressed by asking this research question:

How can a matrix assist in making the mobile phones efficient in rural community development?

The findings revealed that there were people in the community and within the core groups who did not use some of the feature/applications due to limited knowledge. Therefore, a need to understand the use of certain feature/applications was established in the community. The matrix will help such users to be conscious of the features/applications that they use on a daily purpose. With the usage, they will be able to note the skills that they build whilst using different features/applications. The community will have knowledge about different features that are in their mobile phones and their importance. It can be recalled from the case of Bonny in Chapter Six, section 6.5.1, who had a smartphone but did not know how to use applications such as the Internet and messaging platforms. The formulated indicators provide a basis that can be followed in identifying new skills that are required from users and/or the new ones gained. However, a matrix alone cannot ensure efficiency especially when ICT

infrastructure is poor. The poor connectivity impacts negatively on the developmental roles of the mobile phone as not everyone is able to access adequate connection to the network providers. Poor connectivity limits the users' access to voice, messaging and internet based services.

8.2.6 Developing a matrix to measure impact

The last research question was linked to the research problem and wanted to determine how the matrix can be developed. The question was posed as follows:

How to develop a matrix to measure the impact of mobile phones for rural communities?

The capability approach framework (Sen 2005b: 35) was followed in formulating questionnaires in order to establish the community's abilities to carrying out certain activities on the mobile phone. Qualitative and quantitative methods were used to gather the community's experience with the mobile phone (Davids et al 2009: 38, Manda 2014: 5, 6). As it was indicated in Chapter Seven, the indicators and markers were used to help develop the matrix. The indicators were extracted from all the involved community groups and categorised into four groups. These categories were broken down through the use of markers to address all the important groups that make up the community. The indicators were therefore the basis for measuring impact (Achimugu et al 2009: 42, UN 2009a: 29). The markers were also important in making sure that the indicator is measurable as they provide an example of how to determine if that indicator has been met or not. The impact can therefore be measured taking into consideration the gender related aspects to ensure that inequities are also assessed. In this matrix, there was a column to determine whether the user had power to make decisions that enabled the researcher to understand whether access could be impacted by gender. The matrix can be developed in such a manner that it does not only support individual users, but can be encompassed in a community ICT centre where everyone can learn additional skills that could benefit different community groups. The ICT centre can be designed in a way that may allow different groups to experiment with various applications that would support their specific needs. For instance, educational groups may be guided on how to access additional study materials, create study groups on different platforms, as well as on how these

platforms can be securely managed. In this manner, the mobile phone will be used as a private tool which further support the activities that would help other community members.

The next section discusses the contributions of the dissertation with reference to the set objectives of the study.

8.3 CONTRIBUTIONS OF THE DISSERTATION

This section presents the contribution of the study in relation to research objectives. In doing so, the research findings and conclusions will highlight the extent to which the problem was addressed. The first set objective was:

- To investigate how the community members use mobile phones;

The results showed that the community of Phake Rebone used the mobile phones to connect with the people they are close to. Other community members were using it to find employment opportunities. The device was also used for entertainment purposes through gaming, chatting on social media and watching videos shared by friends. The community also used the mobile phone to alert neighbours when in danger through the “buzz” to ensure that they receive help quickly. The educators used it to liaise with the DBE due to lack of other telecommunication infrastructure in the community. The same group used the device for curriculum related activities. Their learners used it for assistance with homework at their homes. The PCHC’s duties were highly reliant on the device to successfully support their home based care duties through the use of PCMBs. Other groups’ relied on the mobile phone for voice calls and SMSs only. The mobile phone was generally adored by the community due to the convenience that it offered. They were aware that they are not using it optimally and expressed a need for training to enable effective use of the device.

The second and third objectives are linked and are therefore addressed simultaneously. The objectives in their orders were set as follows:

- To determine how the identified usage by different groups in the community can be measured; and
- To identify the indicators for measuring impact assessment.

The usage behaviour from the findings was viewed in this study as insufficient in other groups particularly, the health group, community leadership, business and the CPF. Therefore, it was important to determine a means of measuring the people's use/unused capabilities of their mobile phones. The different usages identified from the findings proved to be valuable in measuring the impact of mobile phones. The underlying use by different groups informed indicators that were used to measure impact. Chapter Seven, section 7.3 and its subsections explained how the indicators can be measured with the use of markers and expected outputs as a guide. This proved that the indicators are at the centre stage of measuring impact. Examples were provided in forms of use cases and tables to illustrate how the measurement can be conducted. As such the indicator tables (see Chapter Seven, sections 7.3.1 and 7.3.2) for the core and community groups were developed to show how each group can measure their own usage of the mobile phone including having an idea of how else the device can be used to support their daily key functions. This was formulated taking into consideration, not only to the usage but the other duties that they are currently doing without the support of the mobile phone. However, some of the indicators such as communication and access to information were standard to almost all groups due to the expressed need of such an enabler. Therefore, the indicators for measuring the mobile phone usage were not only listed but were explained on how they can be drawn.

The fourth objective's aim was:

- To adapt indicators that will be necessary for the sectors within the identified rural community in South Africa.

The findings showed that there were access indicators rather than usage ones. As a result, the indicators adopted in this study were those discussed in Chapter One section 1.2.10. Although Achimugu et al (2009: 43), as does the ITU (2014b: 4),

emphasises on household and individual indicators, this study focused primarily on the individual ones and extended them to household in cases where there was only one mobile phone in within a household. The business, education (learner and educator), and government (community leadership) points of focus were aspired by Achumugu and ITU. This research expanded the focus into health, and safety service providers. Access to mobile phone and the internet were the indicators adopted (Achumugu 43; UNICT 2005: 15). Access to information was adopted from Zengpei (2009: 29). The usage indicators could only be found from Boateng (2011: 57), as was indicated already in section 7.2, who looked at the use of the SMS and voice calls to support the small businesses. These were also included in the business group.

The study started with the usage indicators like Internet, making calls, Sending SMS/MMS and internet to gather data from the field. These were used to also determine access. The researcher later grouped the indicators to only show the classification group indicators with the previous basic indicators used to objectify the markers. The main indicator groups that were identified were communication, information, learning, content, educate, training, empowerment, safety, support and community dialogue. These indicators were for all the community groups of the researched community. With these, the study proved that existing indicators can be adopted to suit the measurement needs of different contexts.

The fifth objective aimed:

- To determine how the identified indicators can be evaluated and measured.

The indicators were designed with markers to enable possible evaluation and measurement. The indicator such as 'information' requires enablers that would make it measurable depending on what can be extracted from them. For example, information would require markers such as 'have knowledge,' 'impart knowledge', and have awareness to ensure that it is measurable. The output of an indicator also contributes towards identifying changes brought by the reactions experienced through the indicator. The expected output could be, for example, from the learners' table the outcome is 'ability to complete educational activities through the support of the mobile phone'. In contrary, the unexpected output could be the 'ability to increase vocabulary'.

The study went further to measure the indicators in matrix using the community indicators. The results of the matrix were later used to show how individuals can evaluate their skills through the use of the indicators and development impact assessment results. The matrix was then taken to the community to test it. The participating group was interested in matrix (see section 7.4).

The last objective supported the developed matrix by aiming:

- To produce guidelines that will assist in creating a matrix for measurement and monitoring.

The guidelines were formulated in order to assist researchers and development practitioners to be able replicate the matrix if needs be. The matrix can be used in both local and international contexts given that it is broad and provides room for both access and usage evaluations. This was not the case with existing frameworks and models (Heeks & Molla 2009, Tripathi et al 2012). The matrix can be customised to measure any ICT related devices and services.

This study showed that the increasing growth of mobile phone adoption and use calls for support in terms of users knowing what to do more with their devices. The literature on the impact measurement of mobile phones were next to non-existence although the ICT access measurement shed some light on how to approach the measurement aspect. This study therefore builds on to the ICT in development literature. It also builds up to the measurement of mobile phone impact on development. The developed matrix sets a standard on the measurement and evaluation tools for impact in rural communities. It should be noted as well that the methodological approach limits this study in terms of making generalisations of these findings to all rural communities. In the next section the concluding remarks are shared.

8.4 CONCLUDING REMARKS

In conclusion, the primary research problem is revisited to establish whether the guiding research questions and objectives of the study enabled the researcher to address the research problem. Indeed, the primary and secondary research

conducted in answering the research problem were able to contribute towards developing a matrix that can be used for the evaluation and assessment of the mobile phone for development. The reported use of the mobile phone and challenges that inhibit effective use of the device calls for usage of such a matrix by institutions that have interest in the development of the rural communities such as the government and development practitioners to provide the required support. Provision of employment opportunities, training and improving infrastructure to enable swift access may enable increased use of other applications.

The literature, particularly the international measurement standards (ITU 2014b: 4, 74, UN 2009a: 2) give a basis on how impact can be measured. However, it does not give exact measurement guides for rural communities in South Africa. They do not allow the community such as Phake Rebone to measure their own access and use of the mobile phone, see Chapter Three. A matrix was therefore developed specifically for this community with assistance of some of the existing measurement frameworks. The matrix was developed based on the needs of the community using their indicators. The matrix was also taken back to the community to evaluate whether the captured indicators were representative of their needs. The testing team welcomed the matrix and are looking to a functional one.

The next section provides recommendations and possible research topics for the future.

8.5 RECOMMENDATIONS AND FUTURE RESEARCH

The conclusions arising from this study are clear that the situation on access and usage of mobile phones and related services needs further research. Even though there are issues of unstable connectivity, the users are always keen to use their mobile phones. The outcry on connectivity requires the MNOs to also play their roles in improving the infrastructure to serve the communities better. The ubiquitous infiltration of the mobile phone in rural communities calls for more research to cover the ground. In this light, the following are practical recommendations arising from the study:

1. The impact measurement of mobile phones for development needs to be replicated in other rural communities. A bigger sample that allows to also monitor impact over a longer period is required to further establish more developmental effects of mobile phones in rural communities. As indicated earlier that the methodological approach does not allow generalisation of these findings, a countrywide study may be valuable to further test the matrix. The replication of this study can also be comparative in order to evaluate how this community fares with other rural communities as the profiles of communities are not always the same.
2. The reported high number of smartphones (Chapter Six, section 6.4) signals the availability or opportunity for access to the internet. The low use of the internet then needs to be further researched in order to establish the underlying cause. Even though knowledge has been identified as one of the causes, the internet is one of the developmental topics that need to be researched in rural contexts especially with a growth in accumulation of smartphones.
3. The gender aggregation of data was not satisfactory due to low turn-out of the male participants. It would be ideal to have a similar study with greater reach to the male gender so as to have a meaningful picture of the status quo in terms of access and usage of the mobile phone in development. This can also be addressed as part of point number one above.
4. Operationalise the matrix in the researched community as a means to further test it and empower the community members. Different groups and individuals can then be assessed and evaluated using the digital matrix. The results as was indicated in Chapter Seven, section 7.4 can be fed into the skills tracker in order to provide them with a skills record acquired through the use of a mobile phone. This would also fuel awareness to encourage users to want to continue using their mobile phones to improve their skills.
5. With the growth of mobile applications and venture capital funds being available for such developments (Developer Economics 2013: 17), it is proposed that this matrix be digitised so that users can measure their skills online.

6. An ICT community group can be established and be led by a community champion who will train youth and other unemployed community members on skills that will strengthen vocational skills. As such the champion will be a point of reference in using the matrix and ensuring that it supports the developmental needs of the community. The use of the matrix and the ICT related training will not only benefit the livelihood aspect of the community but assist the PHBC to easily reach patients and receive the already needed skills in ICTs. Initiatives of organisations such as the Foundation for Sustainable Development (FSD) have started similar community development programmes to empower rural communities.

For instance, in Uganda there are programmes that develop vocational skills. In Kenya, resource centres are established by the same organisation for community members to use websites for community organisations to promote access to information the distribution thereof (FSD 2015a: 1). Furthermore, the youth is trained on both the technical and soft skills in order to expose them to the internet and share information through multimedia devices (FSD 2015b: 1). This shows that it is possible for communities to close their knowledge gaps through a concerted effort.

The already existing culture of togetherness in this community can be harnessed to create an ICT community interest group. The matrix can be used with a champion responsible for lobbying other stakeholders to support the community training requirements. Through this group, extended social networks will be created in efforts to lessen the impact of unemployment. The champion will be someone working closely with the existing community groups and organisations who will be offering ICT and vocational aligned training. With such a community based organisation issues of social digital divide will be resolved (Hautekeur 2008: 211). The benefits of such will be to also expand their networks by tapping to other members' connections using chat platforms, email groups, SNS and most importantly share information on topics relevant to the community needs. It is through this matrix that the community participation can be realised in using ICTS to improve their quality of life (Hautekeur 2008: 213).

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APPENDICES

APPENDIX A: BUSINESSES QUESTIONNAIRE

QUESTIONNAIRE ON UNDERSTANDING THE USE OF MOBILE PHONES BUSINESSES

Section 1: Administrative information

Interviewer	
Date	
Interviewer code	

Section 2: Demographics

1. What is your name?

2. How old are you?

20 – 30 years	
31 – 40 years	
41 – 50 years	
51 – 60 years	
Over 60 years	

3. What is your gender? Male Female

4. What is your highest level of qualification?

Grade 1 – 5	
Grade 6 – 11	
Grade 12	
National diploma	

Junior degree	
Post graduate	

Section 3: Business profile

1. What is your business about?
2. For how long have you been running this business?
3. How many full time employees do you have?
4. How many part time employees do you have?
5. Is your business registered? *(if yes continue to 7, if not go to 8)*
6. Which institutions are you registered with?
7. Why you are not registered?
8. Do you use any ICT devices to support your business?
9. Do you know of how they can assist you in managing and operating your business?
10. What are the challenges that you encounter in your business?

Section 3: Access and usages of a mobile phone

1. Would you say a mobile device is important?
2. Do you have a mobile phone? *(if no go to question 6)*
3. Which model is it (if they do not know ask the respondent to you their mobile phone)?
4. For how long have you had your mobile phone?
5. How many SIM cards are you using? If more than one, why?
6. Why are you not having a mobile phone and have you ever used one?
7. What motivated you to want to use a mobile phone?
8. Would you still want to use a mobile in future and why is this?
9. Would you say a mobile phone can improve one's safety?
10. Have you or do you know of anyone who received help whilst under threat or in danger by using a mobile phone

11. Do you think it is necessary to be trained/or taught on how to use a mobile phone?
12. Were you ever taught on how to use the mobile phone, if yes who was it?
13. Are there features in your mobile phone that you are/could not use? Why?
14. Can you list the 3 things that your mobile phone enables you to do that you could not do prior to having it?
15. Are you using social networks and chatting platforms? *(If not, go to 19).*
16. Which ones are you using?
17. What do you normally use them for?
18. How much time do you normally spend on these?
19. Do/have you used your mobile phone to look for other business opportunities? How?
20. How are you using the mobile phone to support your daily business activities?
21. Would you do online courses to increase your knowledge?
22. Do you think applications such as the internet are important in increasing ones' knowledge and understanding your business market?
23. Do you know of any mobile applications that can improve the way you operate your business?
24. Do you know of mobile banking?
25. Are you using it or will you consider using it in future?

APPENDIX B: COMMUNITY QUESTIONNAIRE

QUESTIONNAIRE ON UNDERSTANDING THE USE OF MOBILE PHONES COMMUNITY

Section 1: Administrative information

Interviewer	
Date	
Interviewer code	

Section 2: Demographics

1. What is your name?

2. How old are you?

7 – 14 years	
15 – 20 years	
21 – 30 years	
31 – 40 years	
41 – 50 years	
51 – 60 years	
Over 60 years	

3. What is your gender? Male Female

4. What is your highest level of qualification?

Grade 1 – 5	
Grade 6 – 11	
Grade 12	
National diploma	

Junior degree	
Post graduate	

5. Are you employed? If not how do you survive?

Section 3: Access and usages of a mobile phone

1. Would you say a mobile device is important?
2. Do you have a mobile phone? *(if no go to question 6)*
3. Which model is it (if they do not know ask the respondent to you their mobile phone)?
4. For how long have you had your mobile phone?
5. How many SIM cards are you using? If more than 1, why?
6. Why are you not having a mobile phone and have you ever used one?
7. What motivated you to want to use a mobile phone?
8. Would you still want to use a mobile in future and why is this?
9. Would you say a mobile phone can improve one's safety?
10. Have you or do you know anyone who received help whilst under threat or in danger by using a mobile phone
11. Do you think it is necessary to be trained/or taught on how to use a mobile phone?
12. Were you ever taught yourself, if yes who was it?
13. Are there features in your mobile that you are/could not use? Why?
14. Can you list the 3 things that your mobile phone enables you to do that you could not do prior to having it?
15. Are you using social networks and chatting platforms? *(If not, go to 19).*
16. Which ones are you using?
17. What do you normally use them for?
18. How much time do you normally spend on these?
19. Do/have you used your mobile phone to seek for employment?
20. If employed, are you currently using it for work purposes?
21. Would you do online courses to increase your knowledge?

22. Do you think applications such as the internet are important in increasing ones' knowledge?
23. Do you know of any mobile applications that can improve people's lives (for example health and education apps)?
24. Do you know of mobile banking?
25. Are you using it or will you consider using it in future?

APPENDIX C: COMMUNITY LEADERSHIP QUESTIONNAIRE

QUESTIONNAIRE ON UNDERSTANDING THE USE OF MOBILE PHONES COMMUNITY LEADERSHIP

Section 1: Administrative information

Interviewer	
Date	
Interviewer code	

Section 2: Demographics

1. What is your name?

2. How old are you?

7 – 14 years	
15 – 20 years	
21 – 30 years	
31 – 40 years	
41 – 50 years	
51 – 60 years	
Over 60 years	

3. What is your gender? Male Female

4. What is your highest level of qualification?

Grade 1 – 5	
Grade 6 – 11	
Grade 12	
National diploma	

Junior degree	
Post graduate	

5. Are you employed? If not how do you survive?

Section 3: Background of Community Leadership

1. What do your duties as community leaders entail?
2. What are the different roles?
3. Why did you choose to become a community leader?
4. Are you using any ICT devices to help in carrying out your duties?
5. How are problems within the community communicated to you?

Section 4: Access and usages of a mobile phone

1. Would you say a mobile device is important?
2. Do you have a mobile phone? *(If no, go to question 6)*
3. Which model is it (if they do not know, ask the respondent to show you their mobile phone)?
4. For how long have you had your mobile phone?
5. How many SIM cards are you using? If more than 1, why?
6. Why are you not having a mobile phone and have you ever used one?
7. What motivated you to want to use a mobile phone?
8. Would you still want to use a mobile phone in future and why is this?
9. Would you say a mobile phone can improve one's safety?
10. Have you or do you know of anyone who received help whilst under threat or in danger by using a mobile phone?
11. Do you think it is necessary to be trained/or taught on how to use a mobile phone?
12. Were you ever taught yourself, if yes who was it?
13. Are there features in your mobile phone that you are not using? Why?
14. Can you list the 3 things that your mobile phone enables you to do that you could not do prior to having it?
15. Are you using social networks and chatting platforms? *(If not, go to 18)*
16. Which ones are you using?

17. What do you normally use them for?
18. How much time do you normally spend on these?
19. Do/have you used your mobile phone to lobby or campaign for political positions?
20. Are you currently using it for your community leadership purposes?
21. Have you ever had any community issues raised through the mobile phones?
22. How were they done and how did you respond?
23. Do you know how to set up a political interest group using social networks and chat groups?
24. Do you think such a group may be beneficial for your community?
25. Have you thought of how to use a mobile phone to campaign for the upcoming elections?

APPENDIX D: COMMUNITY POLICING FORUM QUESTIONNAIRE

QUESTIONNAIRE ON UNDERSTANDING THE USE OF MOBILE PHONES COMMUNITY POLICING FORUM (CPF)

Section 1: Administrative information

Interviewer	
Date	
Interviewer code	

Section 2: Demographics

1. What is your name?

2. How old are you?

20 – 30 years	
31 – 40 years	
41 – 50 years	
51 – 60 years	
Over 60 years	

3. What is your gender? Male Female

4. What is your highest level of qualification?

Grade 1 – 5	
Grade 6 – 11	
Grade 12	
National diploma	
Junior degree	
Post graduate	

5. Are you employed? If not how do you survive?

Section 3: Background of CPF

1. What do your duties as CPF entail?
2. Do these duties put you and your loved ones in danger?
3. Why did you choose to be a CPF member?
4. What is your relationship with the South African Police Services?
5. How are problems communicated to you?

Section 3: Access and usages of a mobile phone

1. Would you say a mobile device is important?
2. Do you have a mobile phone? *(If no go to question 6)*
3. Which model is it (if they do not know ask the respondent to you their mobile phone)?
4. For how long have you had your mobile phone?
5. How many SIM cards are you using? If more than 1 why?
6. Why are you not having a mobile phone and have you ever used one?
7. What motivated you to want to use a mobile phone?
8. Would you still want to use a mobile phone in future and why is this?
9. Would you say a mobile phone can improve one's safety?
10. Have you or do you of know anyone who received help whilst under threat or in danger by using a mobile phone?
11. Do you think it is necessary to be trained/or taught on how to use a mobile phone?
12. Were you ever taught on how to use the mobile phone, if yes who was it?
13. Are there features in a mobile that you are/could not use? Why?
14. Can you list the 3 things that your mobile phone enables you to do that you could not do prior to having it?
15. Are you using social networks and chatting platforms? *(If not go to 19)*
16. Which ones are you using?
17. What do you normally use them for?
18. How much time do you normally spend on these?
19. Are you currently using it for CPF purposes? How?

20. Have you ever received complaints through the mobile phones?
21. How were they done and how did you respond?
22. Do you know how to set up a safety group using social networks and chat groups?
23. Do you think such a group may be beneficial for your community and the police that assist you with certain cases?
24. Would you use online courses to increase your skills on community safety issues?
25. Do you think platforms such as the internet can be beneficial in assisting you to increase your knowledge?
26. Do you know of any mobile applications that can improve the way you handle your community safety issues?

APPENDIX E: EDUCATORS QUESTIONNAIRE

QUESTIONNAIRE ON UNDERSTANDING THE USE OF MOBILE PHONES EDUCATORS

Section 1: Administrative information

Interviewer	
Date	
Interviewer code	

Section 2: Demographics

1. What is your name?

2. How old are you?

20 – 30 years	
31 – 40 years	
41 – 50 years	
51 – 60 years	
Over 60 years	
7 – 14 years	
15 – 20 years	

3. What is your gender? Male Female

4. What is your highest qualification?

Grade 1 – 5	
Grade 6 – 11	
Grade 12	

National diploma	
Junior degree	
Post graduate	

Section 3: Background

1. Which grades are you teaching?
2. What types of materials do you use for teaching?
3. Do you use any ICTs to support teaching and learning activities for your learners?
4. Do you have any difficulties using some ICT devices that some of your learners or children use or like?
5. How do you improve your knowledge and how often is this if at all?

Section 4: Access and usages of a mobile phone

1. Would you say a mobile device is important?
2. Do you have a mobile phone? *(If no go to question 6)*
3. Which model is it (if they do not know ask the respondent to you their mobile phone)?
4. How many SIM cards are using? If more than one, why?
5. For how long have you had your mobile phone?
6. Why are you not having a mobile phone and have you ever used one?
7. What motivated you to want to use a mobile phone?
8. Would you still want to use a mobile phone in future and why is this?
9. Would you say a mobile phone can improve one's safety?
10. Have you or do you know anyone who received help whilst under threat or in danger by using a mobile phone?
11. Do you think it is necessary to be trained/or taught on how to use a mobile phone?
12. Were you ever taught on how to use it, if yes who was it?
13. Are there features in a mobile phone that you are not using? Why?

14. Can you list the three things that a mobile phone enables you to do that you could not do prior to having it?
15. Do you use it for your school work? Why?
16. Would you consider using it to facilitate lessons in the classrooms? Why?
17. Do you have access to social networks and chatting platforms? (*If not go to 20*)
18. If yes, which ones are you using?
19. How are you using them for learning activities?
20. If you knew of applications that support learning would you use them? Why?
21. Do you think applications like the internet are valuable in increasing ones knowledge base?
22. What are your key challenges in using the mobile phone?
23. Would you consider doing online courses to improve your knowledge? Why?
24. Do you know of mobile banking?
25. Are you using it and would you use it future? Why?

APPENDIX F: HEALTH WORKERS QUESTIONNAIRE

QUESTIONNAIRE ON UNDERSTANDING THE USE OF MOBILE PHONES HEALTH WORKERS

Section 1: Administrative information

Interviewer	
Date	
Interviewer code	

Section 2: Demographics

1. What is your name?

2. How old are you?

21 – 30 years	
31 – 40 years	
41 – 50 years	
51 – 60 years	
Over 60 years	
7 – 14 years	
15 – 20 years	

3. What is your gender? Male Female

4. What is your highest qualification?

Grade 1 – 5	
Grade 6 – 11	
Grade 12	
National diploma	

Junior degree	
Post graduate	

Section 3: Background

1. What is your job title?
2. What are your roles in this position?
3. Do you use any ICTs to support your daily work activities?
4. How do you improve your knowledge and how often is this if at all?

Section 4: Access and usages of a mobile phone

1. Would you say a mobile device is important?
2. Do you have a mobile phone? *(If no go to question 6)*
3. Which model is it (if they do not know ask the respondent to you their mobile phone)?
4. How many SIM cards are using? If more than 1, why?
5. For how long have you had your mobile phone?
6. Why are you not having a mobile phone and have you ever used one?
7. What motivated you to want to use a mobile phone?
8. Would you still want to use a mobile in future and why is this?
9. Would you say a mobile phone can improve one's safety?
10. Have you or do you know anyone who received help whilst under threat or in danger by using a mobile phone
11. Do you think it is necessary to be trained/or taught on how to use a mobile phone? Were you ever taught on how to use it, if yes who was it?
12. Are there features in the mobile phone that you are not using? Why?
13. Can you list the 3 things that the mobile phone enables you to do that you could not do prior to having it?
14. Do you use it for work purposes? Why?
15. Would you consider using it to educate your patients on certain health issues? Why?

16. Do you have access to social networks and chatting platforms? *(If not go to 19)*
17. If yes, which ones are you using?
18. How are you using them for health related matters activities, especially for/with patients?
19. If you knew of applications that support health matters would you use them? Why?
20. Do you think applications like the internet are valuable in increasing ones knowledge base?
21. What are your key challenges in using the mobile phone?
22. Would you consider doing online courses to improve your knowledge? Why?

APPENDIX G: LEARNERS QUESTIONNAIRE

QUESTIONNAIRE ON UNDERSTANDING THE USE OF MOBILE PHONES LEARNERS

Section 1: Administrative information

Interviewer	
Date	
Interviewer code	

Section 2: Demographics

1. What is your name?

2. How old are you?

7 – 14 years	
15 – 20 years	

3. What is your gender? Male Female

4. In which grade are you in?

5. Which career path are you interested in pursuing?

Section 3: Access and usages of a mobile phone

1. Would you say a mobile device is important?

2. Do you have a mobile phone? (*if no go to question 6*)

3. Which model is it (if they do not know ask the respondent to you their mobile phone)?

4. How many SIM cards are using? If more than one, why?
5. For how long have you had your mobile phone?
6. Why are you not having a mobile phone and have you ever used one?
7. What motivated you to want to use a mobile phone?
8. Would you still want to use a mobile in future and why is this?
9. Would you say a mobile phone can improve one's safety?
10. Have you or do you know of anyone who received help whilst under threat or in danger by using a mobile phone?
11. Do you think it is necessary to be trained/or taught on how to use a mobile phone?
12. Were you ever taught on how to use it, if yes who was it?
13. Are there features in a mobile phone that you are/could not use? Why?
14. Can you list the three things that the mobile phone enables you to do that you could not do prior to having it?
15. Do you use it for your school work? Why?
16. Do you think it will be worthwhile if your teachers also use it to facilitate lessons? Why?
17. Do you have access to social networks and chatting platforms? *(If not go to 20).*
18. If yes, which ones are you using?
19. How are you using them for your studies?
20. If you knew of applications that support learning would you use them?
21. Do you play games on a mobile phone?
22. If yes which games do you normally play?
23. How much time do you spend playing games on a mobile phone?
24. Who taught you how to play those game(s)?
25. Do you have any challenges in using some features in a mobile phone?

APPENDIX H: COMMUNITY SURVEY

SURVEY ON UNDERSTANDING THE USE OF MOBILE PHONES

Section 1: Administrative information

Interviewer	
Date	
Interviewer code	

Section 2: Demographics

1. What is your name?

2. Which age group are you in?

7 – 14 years	
15 – 20 years	
21 – 30 years	
31 – 40 years	
41 – 50 years	
51 – 60 years	
Over 60 years	

3. Participant's gender: Male Female

4. Which category best describes your highest level of qualification?

Grade 1 – 5	
Grade 6 – 11	
Grade 12	
National diploma	
Junior degree	
Post graduate	
Other (<i>please specify</i>):	

5. I am earning a living by _____

Receiving pensioners grants	
Receiving children grants	
Receiving disability grants	
Working as a general domestic work	
Doing part time jobs	
Working as a general administrator	
Working as a professional	
Running my own business	
Depending on my parents	
Going to school	

Section 3: Access to a mobile phone

1. Do you use a mobile phone? Yes No
2. Do you own a mobile phone? Yes No
3. If yes which model are you using? _____
4. This is a standard phone, feature phone or smart phone
5. How many SIM cards do you have? only 1, more than 1 (*if only 1 move to number 7*)

6. The reason I have more than one SIM is because?

Activity	Agree	Disagree
I have a primary SIM card that I use and the other SIM is to access more benefits from other MNOs		
I use both SIM cards and one is on a contract		
The network with other providers is problematic so I want to be reached all the time		

Section 4: How I use my mobile phone (general)

1. Which of these do you use your mobile phone for?

Activity	Regularly	Sometimes	Never
Receive calls			
Make calls			
Send "Please call me"			
Receive SMS			
Send SMS			
Receive MMS			
Send MMS			
Surf the internet			
I receive and send e-mails			
I use internet for home work			
I use the internet to learn about new things			

2. I use the following chat and SNS applications

Service	Regularly	Sometimes	Never

What's App			
BBM			
We chat			
Mobifun			
Facebook			
Twitter			
LinkedIn			

3. With my mobile phone I can...

Activity	Always	Sometimes	Never
Call the police when I am in danger			
Call my neighbours when I feel threatened/scared			
Call the CPF when I feel threatened or scared			
Call the ambulance when I or a family member needs medical attention			
Call a doctor when I or a family member needs medical attention			
Set up an ICE (In Case of Emergency) so that my family and friends can be informed of my emergencies			
Access mobile banking			
Buy electricity online			
Buy airtime			
Learn about new things			
Look up for assistance on school homework			

Section 5: How I use my mobile phone for professional services

1. I use the following services to promote and market my business/myself

Service	Yes	No
SMS		
Facebook		
Twitter		
What's App		
Mixit		
E-mail		
BBM		
Other: (please specify)		

2. For business purposes, I use my mobile phone to...

Activity	Always	Sometimes	Never
Call my customers about products requested			
Call suppliers to make orders			
Send SMS to customers to inform them about promotions the business has			
Send e-mails to customers to inform them about promotions the business has			

Use Facebook/Twitter to promote my business			
Use the internet to market my business (Junkmail/Gumtree)			
Access mobile banking and make payments for my staff members			
Access mobile banking and pay suppliers			

3. My mobile phone enables me to have business opportunities such as,

Activity	Always	Sometimes	Never
Selling airtime through my mobile phone banking			
Selling recharge vouchers through my mobile phone banking			
Charging batteries for community members who do not have electricity			
Fixing people's mobile phones			
Teaching people on how to use services such as the internet and social networks			
Using my to help people access the internet and social networks at a fee			

4. With my mobile phone I can ...

Activity	Always	Sometimes	Never
Make calls to enquire about employment opportunities			

Receive calls about employment opportunities			
Use What's App to get adverts about job opportunities			
Use the internet to look for jobs			
Use Facebook/Twitter/Linked In to look and apply for jobs			
Use the internet to market my skills			

Section 6: How my mobile phone entertains me

1. I use my mobile phone for...

Activity	Always	Sometimes	Never
Listening to the radio			
Listening to music			
Surfing the internet			
Viewing pictures I took			
Viewing pictures/videos/audios shared with me via SNS and chat platforms			
Recording videos			
Downloading and watch videos			
Playing games			
Downloading games			
Downloading books			

Chatting to friends and family on SNS and chat platforms			
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Section 7: Using a mobile phone to be empowered

1. I would like the following with usage of mobile phones...

Activity	Agree	Disagree
Be trained on the valuable things about it		
Teach people about how to use a mobile phone in a respectable manner (e.g. not to insult people on the phone)		
Receive educational apps on my mobile phone to increase my knowledge		
Receive online training on a mobile phone to increase my skills		
Receive training on how to save my contacts to enable easy access during emergencies		
Receive training on how to use the mobile phone to access jobs		
Receive training on how to improve my life		
Receive news about my community		

APPENDIX I: INFORMED CONSENT LETTER

Informed consent letter

I hereby confirm that I have been adequately informed by the researcher about the nature, conduct and benefits of the study. I have also received, read and understood the above written information. I am aware that the results of the study, including personal details regarding my age and educational level will be anonymously processed into a research report. I understand that my participation is voluntary and that I may, at any stage without prejudice, withdraw my consent and participation in the study. I had sufficient opportunity to ask questions and out of my free will, declare myself prepared to participate in the study.

Research participant's name: _____(please print)

Research participant's signature (*for minors parents/guardians should sign on their behalf*): _____

Date: _____

Researcher's name: _____(please print)

Researcher's signature: _____

Date: _____