The role of Information and Communication Technologies in implementing educational and infrastructural development projects: Case studies from Alice, Middledrift and Fort Beaufort in South Africa.

By

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Dissertation submitted in fulfillment of the Master of Social Science Communication Degree

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January, 2016

DECLARATION

I, Thandisizwe, T Ngcume, declare that this dissertation is my original work and every source used has been correctly acknowledged. I also approve that no part of this dissertation has been submitted for a degree at any Higher Institution of Learning.

Signature Date

22/01/2016

DEDICATION

This dissertation is dedicated to my baby boy Hlalanathi Mnombo Fikeni

ACKNOWLEDGEMENTS

I would like to acknowledge the study to Dr OO Osunkunle for his supervision; direction and patience that made me complete this study. I also acknowledge the Ngcume family especially my mother and the Fikeni's for being supportive throughout the academic year.

ABSTRACT

This study evaluated the role of ICTs in implementing educational and infrastructural development projects in Alice, Middledrift and Fort Beaufort. A survey in form of questionnaires was employed in which 120 questionnaires were randomly distributed across households. Forty questionnaires were distributed in each of the three areas understudy. This was supported by one focus group discussions in each area. The findings of the study showed that ICTs play a crucial role in enhancing development. However, the findings of the study further revealed that ICTs in Alice, Middledrift and Fort Beaufort are not well understood yet for educational and infrastructural development. Only a small proportion of respondents showed understanding and use of ICTs and these include students, teachers and others who are computer literate.

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LIST OF ACRONYMS

ARP-Alice Regeneration Programme

ICTs-Information and Communication Technologies

LED-Local Economic Development

NEDA-Nkonkobe Economic Development Agency

RDP-Rural Development Programme

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CHAPTER 1

1.1INTRODUCTION AND BACKGROUND

The United Nations (UN) in 2000 published the Millennium Development Goals (MDGs) to focus on the field of Information and Communication technology (ICT) as delivery mechanism for development (Wertlen, 2008). Information and Communication technologies were perceived as necessarily tools for development. Computers were specifically seen as assets or tools suitable for facilitating development in developing countries (Heeks, 2008). The Millennium Development Goals declaration confirmed that all ICTs in general play a pivotal role in the socio-economic development (Heeks, 2008). The availability of internet, cellphones, and other related usable technological ICTs can be used to communicate or promote development through acquiring educative information. The advent of ICTs and business related programs brought about the field of Information and Communication for Development (Heeks, 2008)

Therefore the rise of internet made it possible for an easy and fast consumption of information. The World Wide Website (www) system in 1989 and the commoditization of digital technologies awakened an era of internet in the 1990s (Weber and Toyama 2010). Hence due to the advent of internet, computers could be used to search for information through search engines and users can communicate across the world or interact with people of a different culture through internet facilities such as *WhatsApp* and *Facebook*. Educative and development information could be accessed easily without the need for physical interaction. Also social media like *Facebook, WhatsApp*, wikis and blogs revitalized the need for social interaction and intercultural communication.

It is noted that ICTs have been viable and necessary for development since the invention of the computer (Weber and Toyama, 2010). In other words, the invention of the computer necessitated the introduction of information and communication technologies such as cellphones and other digital devices. Historically, the developed countries adopted these technologies before they were effectively introduced and adopted by the developing countries and computer usage was strictly available for

academic purposes and governmental organizations (Weber and Toyama, 2010). However, with an elapse of time, these technologies were diffused into the global world for communication and development purposes.

In light of the above, this study therefore focuses on the role played by Information and Communication technologies (ICTs) in implementing educational and infrastructural development projects in Alice, Middledrift and Fort Beaufort under Nkonkobe local municipality. These areas are in South Africa, a developing country in which the adoption of ICTs for development is still ongoing.

1.1.1 The background study of Nkonkobe local municipality

Nkonkobe local municipality is found in Eastern Cape. It was founded in 2000 and is re-organized in Transitional local councils namely Alice, Fort Beaufort, Middledrift, Hogsback and Seymour/Balfour. These are organized in such a way that Alice was positioned as a legislative seat and Fort Beaufort as an administrative seat. The Nkonkobe local municipality is ranked as the second largest municipality since it covers 3 725 km2, and constitutes 16% of the Amatole District Municipality's land (Ntsangani, 2014). Nkonkobe local municipality is a rural municipality geographically found along the mountains of the Winterberg IiNtabazeNkonkobe (Ntsangani, 2014).

Nkonkobe has more than 100 villages, 21 wards and councilors. As it is situated in the poor province of the Eastern Cape, communication, development projects and transportation have become the major problems in this municipality (Ntsangani, 2014). It finds it difficult to communicate their plans to all villages because of their large number and not been able the reach all villages due to the lack of sufficient communication means. Therefore ICTs have played a huge role in communicating municipality programmes.

Therefore this study evaluates the role played by Information and Communication technologies in implementing development projects such as educational and infrastructural development projects in these communities found in Nkonkobe local

municipality, namely Alice, Middledrift and Fort Beaufort in order to understand how ICTs promote development.

1.2 PROBLEM STATEMENT

Rural communities are largely marginalized from educational and infrastructural projects such as the awareness of HIV/AIDS, tertiary education, rural development projects, among others due to the unavailability of ICTs and the internet (Eid, 2011). It is a fact that rural population can hardly afford computers, cellphones and other ICTs this makes them to be disassociated from the rest of the world since they could not be able to access information. But the South African government has since provided ICTs in some of these rural areas to speed up development processes. But are these ICTs helpful to date in ensuring the success of government's development project? Hence, this study reviews the role of ICTs in the implementation of educational and infrastructural projects in such marginalized rural communities under Nkonkobe local municipality. These rural communities are found in Eastern Cape Province defined as the poorest province in South Africa (Shingai, 2009).Therefore, evaluating the role of ICTs in implementing educational and infrastructural development projects in such areas is appropriate and feasible for the study.

1.3 AIM OF THE STUDY

The study aims to understand the role played by Information and Communication technologies in implementing educational and infrastructural development projects in Alice, Middledrift and Fort Beaufort.

1.4 OBJECTIVES OF THE STUDY

The objectives of this study are:

(a) To analyze the role played by ICTs in the implementation of educational and infrastructural development projects in Alice, Middledrift and Fort Beaufort.

(b) To know the educational and infrastructural development projects achieved under the facilitation information and communication technologies (ICTs) in Alice, Middledrift and Fort Beaufort.

(c) To evaluate the perspectives of the community members on the role played or not played by ICTs in educational and infrastructural development in Alice, Middledrift and Fort Beaufort.

1.5 RESEARCH QUESTIONS

(a) What role does the Information Communication Technologies (ICTs) play in the implementation of educational and infrastructural development projects in Alice, Middledrift and Fort Beaufort?

(b) What are the educational and infrastructural development projects achieved with the facilitation of Information Communication Technologies (ICTs) in Alice, Middledrift and Fort Beaufort?

(c) What are the community members' perspectives on the role that ICTs played or not played in implementing educational and infrastructural development projects in Alice, Middledrift and Fort Beaufort?

1.6 SIGNIFICANCE OF STUDY

This study explores the role played by ICTs on the implementation of educational and infrastructural development projects in Alice, Middledrift and Fort Beaufort. The study therefore aims to contribute to the field of development communication by studying the use of ICTs for development programmes in underprivileged societies like these selected areas. The selected areas, Alice, Middledrift and Fort Beaufort, are rural places where ICTs are used to enhance development. Therefore, identifying the importance of ICTs for development in these areas would also provide the government with useful information on the promotion of ICTs for development.

1.7 STRUCTURE OF DISSERTATION

Chapter 1: Introduction and Background to the Study-This gives the introduction and background of the study including the problem statement, aim of the study, objectives, research questions and the significance of the study.

Chapter 2: Literature Review- Chapter 2 involves the review of literature under study and the theoretical framework that best explains the phenomena understudy.

Chapter 3: Methodology-.This covers the methodology understudy such as the research method, data collection, population and sampling techniques

Chapter 4: Discussion of findings- This chapter involve the discussion of the research finding and data analysis

Chapter 5: Summary and recommendations- This pertains the summary of the research findings and research recommendations

CHAPTER 2: LITERARTURE REVIEW

2.1 INTRODUCTION

This chapter covers a review of literature on several publications available that focus on the role played by Information and Communication Technologies in the implementation of development projects. Literature review is defined as a critical analysis of published sources on the phenomenon under study (Jesson, Matheson and Lacey, 2011). This chapter also focuses on reviewing the available development projects facilitated by ICTs for in South Africa as a whole including Alice, Middledrift and Fort Beaufort in Eastern Cape, South Africa. In this regard, theoretical frameworks for this study are also discussed in this chapter. Thus the study takes note of the literature underpinned in the theories such as participation and diffusion of innovation theory.

2.2 INFORMATION AND COMMUNICATION TECHNOLOGIES (ICTS)

ICTs can be used for different purposes that involve the means of capturing, storing, sending or transmitting, processing as well as visualizing information electronically (Olowokere, 2006). These ICTs include “modern technologies/devices such as computers, Internet, World Wide Web (www), multimedia, overhead projectors, CD-ROM, data processors, video players, fax machines, and telephones (GSM/land line), as well as traditional media such as radio and television” (Oladeji and Oyesola, 2011: 259). I also agree that ICTs such as computers can also be used for keeping databases.

Some studies reveal that ICTs have contributed to the fast information consumption, hence creating the world into a “global market place” (Morales-Gómes& Melesse, 2010: 3). Even in remote places in South Africa and other developing countries, ICT are beginning to penetrate and these include the use of satellite dishes, micro electronics, computers, telephones, e-mail, internet and amongst others (Morales-Gómez& Melesse, 2010:3-4).The ICTs have also facilitated interaction among business organizations, facilitated human development and set the global community more interactive (Morales-Gómes& Melesse, 2010:4). I therefore add that ICTs also facilitate interaction even among social people through social networks.

In developing countries, internet use has been growing to “more than a quarter of a billion people” (Halewood & Kenny, 2010:172). The challenge has been the less access to computers, given that “47 per 1,000 people” have access to computers and the large number of households in developing countries have “no fixed internet access” (Halewood & Kenny, 2010:172). However, traditional ICTs such as radio and television have been commonly used in developing countries with 80% of the populace listening to radio almost weekly (Eltsroth & Kenny, 2003). I perceive this as true, that the most accessible ICT is the cellphone which is increasingly gaining penetration, especially to young people (Halewood and Kenny, 2010).According to Halewood and Kenny (2010) although many people have cellphones, few have access to the web, while the primary use of cellphones in rural areas studied in three developing countries, were to contact immediate people such as family members when needed (Souter, 2005). Also accessing the web amongst the youth, was initially entertainment wise, while reading news and getting business information was secondary (Souter, 2005).I also agree with the point that most young people access the web just for entertainment.

2.3 EDUCATIONAL PURPOSES OF ICTS

ICTs have been used for different purposes including education. In developing countries, such as South Africa, young people “have had greater educational opportunities” than the previous generations who lived before the advent of modern ICTs such as computers (Halewood & Kenny, 2010:174). The youth could now use internet to acquire information. In developing countries, for instance, internet use by young people was found to be mainly based on emailing and finding information (Geary, Mahler, Finger, & Shears, 2005). It must also be noted that educationally, young people have become globalized through ICTs.

Moreover, e-learning has been advantageous, especially to adults who can study while at work or home. Thus, technological advantages for education in the twenty-first century have gained prominence among the users (Clarke, 2002:12).Also the Internet as a resource has promoted e-learning which has resulted in the promotion of education. The benefits of e-learning include;

> "the ability to customize learning to the needs of an individual and the flexibility to allow the individual to learn at their own pace, in their own time and from a physical location that suits them best" (Javis and Parker, 2006:196).

This means that some distant individuals with access to internet can easily access information available on the website of the institution they are registered hence attaining relevant training and education. I want to add that the internet has provided easy access to the institution's corporate information just by accessing the institution's website.

Other ICTs such as radio and television also facilitate subject lessons through interaction between the presenter and the audience, and such knowledge acquired would have taken one to buy a textbook (Adkins, 1999:8). Interactive lessons facilitated by ICTs avoid costs outside the classroom by "including a range of interactive radio and television programs designed for student audiences" (Halewood & Kenny, 2010:174).

> "Broadcast media has been widely used to combine education and entertainment to provide important messages about health topics, with examples including same-language subtitling and entertainment programmes containing messages about HIV awareness" (Halewood & Kenny, 2010:174; Kothari, Pandey, & Chudgar, 2004:26).

I would like to agree with the fact that ICTs, promote programmes such as HIV awareness, social awareness and many other social challenges issues.

2.4 PRODUCTION AND ADDITIONAL INFRASTRACTURE ASSOCIATED WITH ICTS.

Many studies have been focusing on analyzing how ICTs affect productivity. ICTs are a resource for knowledge, communication and storage, as well as equipment necessary for production. Some scholars also have proven that ICT investment was associated with improvement in productivity and economic growth (Brynjolfsson, and Hitt, 1996; Siegel, 1997; Lehr and Lichtenberg, 1999; Brynjolfsson and Hitt, 2000;Oliner and Sichel, 2000; Jorgenson and Stiroh, 2000).

I am of the opinion that ICTs increase productivity at workplace only if they are

fully utilized. The productivity improvement brought by ICTs were associated with the growth contribution based on investment facilitated by ICTs and increase of the Gross Domestic Product (Colecchia and Schreyer, 2002; Daveri, 2002).

According to Dewan and Kraemer (2000), developed countries enjoy substantial benefits or gains from the output brought by the use of ICTs while the developing countries are still struggling to utilize the output of ICTs due to the shortage of additional infrastructures. Interestingly, ICTs components such as internet host, personal computers, and cellphones are said to have had an impact on the levels and growth of income since they basically promote communication and information resource (Becchetti and Adriani, 2005). Related studies evidenced that ICTs have great effect on output and productivity (Kraemer and Dedrick, 2001).In addition, most workers in factories have been using ICTs to increase production through acquiring adequate information from internet, computers, mobile phones and fax machines (Oladeji and Oyesola, 2011:259).

2.5 ICTS IN THE AGRICULTURAL SECTOR

The advent of ICTs has also brought some transformational changes in the agricultural sector through the availability of efficient information. The 2003 and 2005 World Summit on the Information Society (WSIS) emphasized the importance of ICTs in enhancing food security and rural livelihoods (Oladeji and Oyesola, 2011:259). I agree with the fact that through ICTs, farmers could acquire information on climate change, growing seasonal crops, amongst others. The agricultural sector, draws upon infinite sources of widely dispersed, locally contextualized knowledge, with a considerable body of research materials, which relies upon the continuous flow of information from local, regional, and world markets, which shows that ICTs have presented new dimensions to agriculture (Oladeji and Oyesola, 2011: 259;Engelhard, 2013).

Therefore, ICTs enable the fast consumption of information that can be accessed efficiently, scientifically, technically, and effectively on the market information (Aina, 1999). According to Kiplang'at (2003) cited in (Oladeji and Oyesola, 2011: 260) ICTs

> "Offer tremendous capabilities to the agricultural sector in terms of vast information storage, fast and inexpensive communication channels, links between different media, and easy and enjoyable use at comparatively low and declining costs"

It is also important to note that various stakeholders in agriculture have been exchanging information on the best practices, knowledge, skills and management in agriculture through the use of ICTs (Oladeji and Oyesola, 2011). This therefore means that inadequacy of information would cause drawbacks in agricultural development (Kiplang'at, 2003).

2.6 THE LINK BETWEEN ICTs AND DEVELOPMENT

It is a challenge introducing ICTs for development in developing countries where they are less understood. ICT-induced development can become unrealistic to the people who do not understand the value and use of ICTs (Rao, 2005). The term "development" should be contextually defined with respect to the role of ICTs and the factors involved to accomplish the development programme (Ssirmai, 2005). When the targeted development is not precisely defined, the idea becomes techno-centric (Rao, 2005). I understand this as meaning that the development programme should be clearly planned in terms of what is supposed to be achieved with ICTs. Rao (2005) adds that the use of ICTs for development should not neglect factors that enhance the development process such as financial resources sustainability of infrastructure and associated technologies, as well as human resources to run and maintain the ICTs.

The role played by ICTs is that people can implement tasks easily without exerting too much effort or human ability. ICTs can therefore be used to store information in databases and information can be sent to various audiences simultaneously and instantly (Sithole *et al.*, 2013). The mass media has also been made vibrant through the adoption of ICTs. Moreover, ICTs are subject to innovation hence rural development

can be facilitated through acquiring modern technologies (Sithole *et al.* 2013). I want to agree that modern technologies can be adopted to increase efficiency and productive use of rural resources. Also noteworthy is that the adoption of ICTs in rural areas can also increase employment opportunities (*Albu et al*., 2003).

The link between development and ICTs is therefore based on the fact that development is positively influenced by ICTs. It is noted that South Africa has been benefiting from such developments, although the population have limited access to ICTs such as computers (Tongia *et al.,* 2005). The Co-operative Financial Institute of South Africa (COFISA, 2013) states that in South Africa, 2.3% of rural households now have access to computers. This shows that very few people have access to computers and cellphones in rural areas. l also want to add that establishing ICTs requires infrastructure development. The challenge involved is that rural communities are characterized by poor infrastructure and vandalism of existing infrastructure, electric power shortages, and geographical and topographical location problem (Sithole *et al.,* 2013).

2.7 ICTS FOR DEVELOPMENT AND CONTEXTS OF DEVELOPMENT

ICTs for development can be implemented successfully in a context where they are fully accessed and this is evident by the fact that policies formulated for ICTs and developments in developing countries have been unsuccessful due to their context (Galperin, 2010). l agree with the fact that ICT initiatives succeed in developed countries because they use frameworks designed for their context. ICTs for development are mostly guided by a formulated policy. A policy provides guidance, rules or regulations for implementing development projects (Torjman, 2005). In Africa, development policies in regard to ICTs are said to have become irrelevant in many areas. Development policies in regard with ICTs are affected by politics in Africa. African governments in developing countries tend to come up with policies that downplay the effective implementation of ICTs for development (Gillwald, 2010). l would like to suggest that the reasons for that might be the fear to be transparent and allow the implementation of ICTs presumed to promote democracy. Hence this leads to poor research for ICT

initiatives and policies relevant for the place (Gillwald, 2010). Policies formulated might be void of proper research, having irrelevant statements, theoretically approved but practically nothing (Usman and Said, 2012). The policies become rhetoric as they lack facts and good evidence (Weber and Toyama, 2010).

2.8 SOUTH AFRICAN CONTEXT

Poverty reduction and promotion of education is still a challenge in South Africa. ICT service provision has been one of the agendas to offer better living standards to rural population. The government since 2001 has been making efforts to source finances for investment in rural ICT development projects (Singh, 2008). This commitment depends much on the provincial government's implementation of the ICT development policies (DPSA: 2006). For instance, Eastern Cape Province remains the poorest place in South Africa despite the fact that the government provides funds yearly into provinces for development (Shingai, 2009).

I want to add on that a large number of people in rural Eastern Cape have a number of basic needs they would want to get before acquiring ICTs for development. Yet these rural places, Nkonkobe local municipality as one of them, are lagging behind in the implementation of ICTs for development compared with urban areas although the government releases funds yearly to provincial governments for ICTs development (Shingai, 2009). In 2000, many of South African rural places were backward, impoverished and with very low economic values (Acacia, 2000).

2.8.1 Development and ICTs in South Africa

South Africa has the highest level of ICT development projects in Africa (Etta *et al*., 2003). The Department of Public Service and Administration came up with a 10 year policy in 2001 to ensure that ICTs are available and accessible at rural or grassroots level by 2011 (DPSA, 2001). This programme was meant to ensure access to governmental services and all kinds of necessary information. Also the programme ensured that people have access to computers by promoting the building of telecentres. This means people could use telecentres to socialize, access educative

information and training, business updates, government information, search for employment, just to mention a few (Etta *et al*., 2003). A tele center is a centralized computer shop where people may access information on internet (Etta *et al*., 2003). A good example is particularly a telecentre in Mankweng, Limpopo province, although it got vandalized and only used to offer typing services for students (Lesame, 2008). This partly shows that rural areas are one of the difficult areas to establish and maintain technological innovation.

2.8.2 Lack of rural utilization of ICTs

It is noted that rural people do not make full use of ICTs for development and this is one of the challenges that developing countries experience. This makes the technological task for development difficult and contributes to design-reality gaps (Walton and Heeks, 2011). 'Design-reality gap' means failing to implement the technology suited for the development project (Walton and Heeks, 2011). The Technology Acceptance Model coined by Davis, Bagossi, and Warshaw (1989) shows that knowledge about the type of technology to adopt is essential in the implementation of development projects. I want to agree with the point that participants should have understanding of what to use in order to achieve the intended development objectives. However, poor rural people lack the understanding of ICTs for development and fail to use them effectively.

> "In most cases there is a sense that public access venues in rural locations are underutilized, especially by those considered most disadvantaged or those who could benefit the most " (Sey, 2009: 7)

It is noted that some of the rural disadvantaged people are computer illiterate, meaning they cannot fully use of the ICTs for development tools. Scholars note that failures to use the internet productively were caused by the challenges such as poor infrastructure, poor connectivity and lack of sufficient demand from the users and unskilled tele center management (Dossani *et al*., 2005; Gollakota, 2008).

2.9 DEVELOPMENT PROJECTS IN NKONKOBE LOCAL MUNICIPALITY AND ICTs

In 2010 the Nkonkobe Economic Development Agency (NEDA) and the University of Fort Hare alumni worked together to sponsor computers and other technological

equipment to disadvantaged Nkonkobe local schools (Maluleke, 2010). There are specific development programmes facilitated by ICTs in Nkonkobe local municipality (ASPIRE, 2014). The Local Economic Development (LED), Nkonkobe Economic Development Agency (NEDA) and MTN foundation have been promoting these development programmes such as skill training or educational, tourism infrastructure, agricultural and business development with the aim to foster local economic development, to better communication skills and making use of the new ICT for enhancing development projects and thrived to drive development in the region. The ICTs facilitate the communication process about these development projects across the governmental departments which in turn benefits Nkonkobe Local municipality. Innovative ideas are communicated to promote and sustain development in poor rural areas (ASPIRE, 2014).

Furthermore, Information and Communication Technology (ICTs) have shown to be vital in ensuring social and economic development (Pule, 2013). The Eastern Cape Province is facing challenges for ensuring access to basic ICT infrastructure. One of the key government priorities was to improve access to ICT in order to be improving quality of the lives of the people by connecting them to the rest of the world and a bigger universe of services that would not normally be available to them (NEDA,2014).

2.9.1 Educational projects

Education is one of the fundamental aspects for progressive development. It is noted that MTN South African foundation purpose for the sponsorship was to promote computer skill training among students in schools, such as the Jabavu High school. The Head of MTN South African Foundation during the launch of media centre in Jabavu High School, in Alice notes that computers were donated to 15 schools in the Nkonkobe (Maluleke, 2010). Students' access to computers connected to internet was meant to assist in educating them with innovative development ideas and to inform themselves about other developments happening in the world (NEDA, 2014).

The MTN foundation invested around 9 million rands to each province in South Africa for educational development (Maluleke, 2010). In Eastern Cape, 15 schools from 2009 to 2010 including those in Nkonkobe local municipality were upgraded and technological resources were established such as computer laboratories (Maluleke, 2010). Also 50 students from 25 schools were selected for the educational project with 6 curriculum advisor to receive training on online numeracy maths, science and technology. The MTN foundation also embarked on an integrated socio-economic development approach in which education, arts and culture, health and entrepreneurship are been implemented to facilitate community developments in the Nkonkobe Local Municipality (Maluleke, 2010). I want to agree that development projects were meant to establish better schools in Nkonkobe and to upgrade these schools like other schools developed in urban areas. Thereby promoting progressive society of young people connected to the global world.

2.9.2 Infrastructural development and business sector

Infrastructural development is highlighted in the municipal Local Economic Development (LED) vision (NEDA, 2014). The municipal Local Economic Development (LED) aims to improve easy access to rural communities so as to attract investment through establishing a business centre and preserve tourism sites. Its other importance was also to look at reducing the backlog to gain access to electricity, telecommunication and upgrade of roads especially in the rural areas (Mago and Hofisi, 2013: 58).

The Nkonkobe Business Support Centre (NBSC) was successfully established in 2012 (NEDA, 2014). NBSC is organization that supports and promotes small businesses. Currently the centre has been monitored and funded by the local municipality and also sponsored by MTN foundation. It was established due to the demand made by the people in the area who were in need of Small Medium Micro Enterprise (SMME) business and entrepreneurial support programmes (NEDA, 2014). Development of business centres is enlisted in the government initiative plans to stimulate and support economic activity in underprivileged areas of the Eastern Cape. Since February 2012 the Nkonkobe Business Support Centre is said to have assisted over 1755 small scale enterpreneurs and SMME owners (NEDA, 2014). It registered 49 entrepreneurial

businesses with big scale companies and offered free administrative support and access to ICT equipment for 301 entrepreneurs (individuals or SMMEs) (NEDA, 2014). The ICTs equipment are also not reported on how they transformed the businesses of these 301 entrepreneurs. Since adoption requires one to make “full use of an innovation as the best course of action available” (Rogers, 2003: 117).

2.9.3 Alice Regeneration Programme (ARP)

In the early 2000 local stakeholders and the University of Fort Hare Alumni had started a Alice Rejuvenation Programme, this programme involved the ASPIRE, Nkonkobe Economic Development Agency, Nkonkobe Local Municipality and other provincial partners which had played a crucial role and been supportive since the year 2007 (Alice Regeneration Programme, 2010). The Alice Regeneration Programme was developed or established to make Alice a more economically and socially viable university town and it was guided by the Alice regeneration strategy in 2007 (ASPIRE, 2010). I perceive that developing Alice as a University town would mean attracting students from different places hence diffusing Nkonkobe into a heterogeneous population with different ideas from all walks of life.

This development of this programme occurred only after a consultative process over two years culminating in the development of the Alice High Level Feasibility Assessment (2010) and the Local Spatial Development Framework for Alice (LSDF) and its environs (ASPIRE, 2010). The municipality development Alice Project shows that that the Alice LSDF has provided the spatial guidelines for the development of Alice and has given the Alice Regeneration Strategy a clear vision and framework. This vision maintains long term development in Alice or the Nkonkobe Local Municipality at large for a duration of over the next 15 to 20 years and the programme included objective strategies such as integration of University of Fort Hare, Lovedale College and Fort Cox Agricultural College in Middledrift with Alice to become a true University town, supporting a sustainable community by preserving and restoring community assets and economic opportunities and to develop an economically active, culturally vibrant community by encouraging investment (ASPIRE, 2010). Since this is a long term plan, it

involves infrastructural development, awareness and innovation of the vision until all is achieved. However, since development is a long process initiative that demands communication, cooperation and commitment. I want to add on that the Alice Regeneration programme would be determined by the adoption of innovation process, communication and time.

Partners involved in the Alice Regeneration development were also looking forward to identify key issues that has underpin the strategic objectives and this includes the disposal of state owned land, the upgrading of infrastructure, and a commitment to an integrated and inclusive approach to development in Alice (NEDA, 2014). The Alice Regeneration Programme (ARP) initiatives described as catalytic projects to be implemented by ASPIRE. These include a paved road, a steel suspension, and electrical lighting to connect Alice Business District (CBD) to Lovedale College and Victoria Hospital, also upgrading the public transport station in Alice, the Alice CBD and Civic Core; and Gaga Street, the Alice Sports and Education shone (ASPIRE, 2010). These catalytic projects were supported by a range of development initiatives in Alice by other development partners already in various stages of implementation (ASPIRE, 2010). Little has been accomplished to date, as only 3 applications for the disposal of state-owned land has been submitted, approved and released to the Nkonkobe Local Municipality (NEDA, 2014).

It is recorded that the Eastern Cape Department of Public Works released the land between Alice and Ntselamansi, Tyume Street, to Nkonkobe Local Municipality (NEDA 2014). ASPIRE has designed the formalization of the present pathways and reconstruction of the pedestrian bridge (NEDA, 2014). The vision notes that these development projects should attract tourists and develop Alice into a University town in consideration of Lovedale College and Univeristy of Fort Hare to build more residences for students. Lower Gaga Street was released for development of student accommodation (NEDA, 2014). Corner of Main Street and McNab drive was also released to University of Fort Hare for development. This development is underway.

Since Alice Regeneration Programme accounts for the duration of over 15-20 years, it has been several years from the time this programme was organized.

2.9.4 Agricultural sector

The majority of the population in the Eastern Cape relies on Agriculture. The Farmers who have better access to ICT have better lives because of the benefits of modern agriculture and its benefits trends, implications and access to “price information farmers” will be informed of the accurate current prices and the demands of the products (Agholor: 2012). Local Economic Development (LED) in Noncore local municipality strategically supports agriculture by assisting small scale farmers. Smallholder farming is beneficial to the economy by reducing poverty and increasing economic growth (NEDA, 2014). Eastern Cape is one of the provinces with climatic changes favorable for agriculture (Agholor: 2012). Smallholder farmers do sometime lack access to educative information and training.

The University of Fort Hare, Lovedale College and Fort Cox have agricultural training that has impact on students. However small scale village farmers might not access University or Collage training. Nkonkobe Local Municipality support agricultural activities such as crop and livestock production, soil testing, citrus and stone fruits and irrigation infrastructure. Local Economic development sponsored agricultural projects such milk and growing vegetable production at Fort Hare University which contributes to economic development by creating employment (ASPIRE, 2010). Moreover, Alice AgriPark run by University of Fort Hare and sponsored by the Department of Rural Development and Land Reform promotes and develops agriculture and agro-processing in Alice (Agholor: 2012). ICTs were proposed to facilitate these programmes through communicating these programmes to different farmers. Little is mentioned about how ICTs facilitate these agricultural programmes.

2.10 THEORETICAL FRAMEWORK

The theoretical framework is the structure support theory of a research study. The theoretical framework presents and defines the theory that explains why the research

problem under study exists (Swanson, 2013). This study uses diffusion of innovation theory supported by the participation communication theory.

2.10.1 Diffusion of Innovation Theory

Diffusion of Innovation theory assumes that innovations can be diffused into societies. Roger (2003) explains an innovation as an idea, behavior, or object taken as something new in the community. According to Rogers (2003:177) communities have been adopting new innovations which are also technological in nature. Societies have been adopting new dimensions of technology over a long period of time. These innovations flow from developed places through certain channels to undeveloped areas or peripheries for example rural communities. Rogers (2003:117) defines “adoption” as “full use of an innovation as the best course of action available” and the opposite is to “not to adopt an innovation”. He goes on to say that diffusion is “the process in which an innovation is communicated through certain channels over time among the members of a social system” (Rogers, 2003:5). There are four key components of diffusion of innovation theory namely innovation, communication channels, time and social system.

2.10.1.1 Innovation

As aforesaid an innovation is taken as a practice, an idea or development project seen as new by individuals or community (Rogers, 2003:12). What is perceived as an innovation varies from this society to another because societies evolve separately. Some innovations have been there before but they may be perceived as new by other disadvantaged societies. Innovations have transformed societies from traditional or rural to modern by giving them access to technologies. The adoption of innovations by societies brought cultural, behavioral or development related changes. Hence some innovations are sometimes rejected or adopted due to uncertainties of their consequences. Rogers (2003:436) postulates that “consequences are the changes that occur in an individual or a social system as a result of the adoption or rejection of an innovation.” Therefore people must be informed or taught about the advantages or disadvantages of a particular innovation before they adopt it to make them aware of the

consequences. Adopting an innovation for development would require some specific time and communication through efficient reliable channels.

2.10.1.2 Communication Channels

The next element of diffusion of innovation involves the issue of communication channels. Rogers (2003:5) defines communication as “a process in which participants create and share information with one another in order to reach a mutual understanding.” This means participants might be emanating from the same community or across communities. The participants are seen as sources of information, individuals or groups that send the message. In other words, the individuals, groups or sources of information send out an idea or innovation to other groups through a communication channel. According to Rogers (2003: 204) “a channel of is the means by which a message gets from the source to the receiver”

Therefore diffusion involves communication that includes an innovation, communities or two individual, adoption and communication channels. The mass media and other types of communication such as interpersonal communication that includes radio, internet, television, consist of a two way communication process. The communication process consists of the diffusion of innovations. Rogers (2003:19) posits that “diffusion is a very social process that involves interpersonal communication relationships.” This shows that the social process can create or change the participants’ attitudes, build new perspectives about reality and enhance intercultural relations. It can also have a role in transforming beliefs, education, amongst others (Rogers, 2003:19).

2.10.1.3 Time and Social system

The diffusion of innovation theory emphasizes the aspect of time for the adoption of that innovation. Rogers (2003: 20) argues that “the innovation-diffusion process, adopter categorization and rate of adoptions all include a time dimension” The concept underlines that these aspects involved in the innovation-diffusion process takes a certain time frame to be completely adopted. The process depends on a social system that might also determine a timeframe for the innovation-diffusion process. Rogers

(2003:23) defined the social system as “a set of interrelated units engaged in joint problem solving to accomplish a common goal.” These social systems have different social structures or units which affect individuals’ innovativeness (Rogers, 2003). Social systems are political, economically driven have different rules and regulations. The diffusion-innovation theory is used in this study to analyze the role played by ICTs in the implementation of innovative ideas or the adoption of innovations in the Nkonkobe local municipality and to find out if these ICTs were effectively used for development.I therefore want to agree that adoption of ICTs for development would enhance the diffusion of innovation.

2.11 PARTICIPATION COMMUNICATION THEORY

The participation communication theory assumes that people can use the mass media, traditional and inter-personal means of communication to empower themselves in their communities so as to develop and achieve developmental goal (Tufte and Mefalopulous, 2009). The purpose of communication is to create mutual understanding among community members or participants as they share meanings, perceptions, worldviews and general knowledge. This implies the notion of working together for development purposes as a participants or community. The theory can be used to evaluate the local people’s participation in the development process and their utilization of ICTs.

2.11.1 Rural development and Information systems design

Participation of local people in development programmes is broken into two domains that is “rural development processes in developing countries and information systems design”(Puri and Sahay, 2007). According to Puri and Sahay (2007) participation should be relevant to the locals and contemporary as in what they aim to achieve. ICTs facilitate the participation process. ICTs should be “integrated within rural development initiatives in developing countries, for example in e-governance” (Puri and Sahay, 2007)
The problem lies on stakeholder involvement in the development process. Participation pertains key aspects such as;(a) who defines the participation agenda, (b) what capabilities do stakeholders have to participate and how can this be strengthened, (c)

what is the role of institutional conditions in enabling effective participation, and (d) how do local participatory processes experiences get integrated into broader networks to become sustainable (Puri and Sahay, 2007).

The above questions are theoretically essential in participation for development and ICTs. When these questions are answered then contemporary participation in development could be achieved. Integration of ICTs with local people's-participation becomes more effective when development projects are also supported by the government through e-governance (Krishna &Walsham, 2005; Bhatnagar&Schware, 2000; Warschauer, 2003. Thus the participation communication theory integrates structural and structural and behavioral approaches to participation (Puri and Sahay, 2007). Some scholars note that the integration of ICTs in development participation simplifies communication between the government and the people, instilling transparency and destabilizing bureaucratic controls, inefficiency and corrupt systems (Goswami, 2002; Singh, 1999). Hence participation in development programmes has achieved socioeconomic development and led to the conservation of natural resources (Chambers &McBeth, 1992; Agrawal& Gibson, 1999).

2.12 CONCLUSION

This chapter covered the role played by ICTs in development. ICTs can perform a variety of tasks such as capturing, storing, sending or transmitting, processing as well as visualizing information electronically (Olowokere, 2006). These devices such as computers, cellphones (both connected to internet and without) and traditional ICTs, radio and television, among others. ICTs have been facilitating different educational, (economic, social and political) programmed in both developed and developing countries. In South Africa, rural development has been also facilitated by ICTs. This means ICTs play an essential role in development. In some contexts, it has been a challenge to introduce ICTs for development in developing countries where they are less understood. According to Rao (2005) the link between ICTs and development has not been quite understood in some parts of the world. Knowledge towards using ICTs for development is essential (Rao, 2005). Development programs supported by ICTs

should be well planned on how they will enhance education, sustainability financial resources, infrastructure and associated technologies, human resources.

The theories reviewed for the study, namely diffusion of Innovation theory assumes that innovations can be diffused into societies. An innovation is an idea, an objective for development that can be contemporary to the community (Roger, 2003). Communities have been adopting new ideas or innovations for development which are also technological in nature (Rogers, 2003:177). Adoption of innovation can take some time, communication within the context in which it is intended to be achieved. The participation communication theory assumes that people can use the mass media, traditional and inter-personal means of communication to empower themselves in their communities so as to develop and achieve developmental goal (Tufte and Mefalopulous, 2009). This means people can utilize ICTs which facilitate the communication among themselves. Communication is actually essential in reaching understanding and achieving goals. All stakeholders should be integrated in the development process through ICTs

CHAPTER 3: RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter focuses on the research methodology used in this study. Also discusses the research paradigm and design. The chapter also look at the data collection method and data analysis. The research methods adopted for the study involve a survey and focus group discussions in Alice, Middle drift and Fort Beaufort to analyse the role of ICTs in the implementation of educational and infrastructural projects.

3.2 RESEARCH PARADIGM

Quantitative and qualitative paradigms are adopted for this study. Quantitative design involves the study of a phenomena based on theoretical variables, statistical procedures and analysing data quantitatively or in numbers in order to test the hypothesis and to find out if the ontological assumptions are true (Creswell, 2007). This study adopts a quantitative approach to give numerical information on the number of development projects supported by ICTs in Alice, Middledrift and Fort Beaufort. Quantitative approach gives numerical information about the phenomena under study (Punch 2004). It enables the researcher to approach the issue under study objectively without focusing much on the subjective judgements or biases.

A quantitative research approach was suitable for the study because the researcher aimed at finding out the educational and infrastructural development projects facilitated by ICTs. A questionnaire of 120 copies was distributed to find out people's perspectives on the role of ICTs for educational and infrastructural development projects. On the other hand, qualitative approach is interpretive, subjective viewed as field research, critical research, ethnographic (Du Plooy, 2001). This is when the researcher analyses data without quantifying or without an objective approach altogether. It is an interpretive or subjective approach of constructing the qualitative aspects of communication experiences (Du Plooy, 2001). The researcher conducted 3 focus group discussions, each per the area of the study, Alice, Middle drift and Fort Beaufort. Participants in the qualitative research approach were able to share some experiences with the topic under

study. Qualitative research, therefore gives the researcher an opportunity to analyse the participants' perspectives about the role of ICTs on educational and infrastructural development projects.

Using both quantitative and qualitative approaches was therefore necessary because it enabled the researcher to view data from subjective and objective aspects. Using quantitative research method such as a questionnaire was appropriate as it prompts numerical presentation of research findings while using the qualitative research method was necessary in interpreting the data critically. Quantitative research broadens the scope of analysis as in large number of units (Creswell, 2007). The number of participants, who responded to the 120 distributed questionnaires and those who participated in the focus group discussions are essential in determining the results of the study.

3.3 RESEARCH DESIGN

Research design is the data collection and data analysis method available for the research (Du Plooy, 2001:62). Research design encompasses the research methodology. Research design is a systematic, methodological way of executing a study as well as addressing a research problem (Leedy and Ormrod, 2001). Research design offers the researcher, a structure of procedures on how to approach a study, how to collect data, analyse data and lastly how to conduct the study as a whole, step by step. A research design is based on the data collection and analysis procedures (Welman, Kruger and Mitchell, 2005).This study makes use of mixed methods for data collection and analysis. The study uses both quantitative and qualitative research methods.

Research design also involves the use of research instruments and strategical steps that should be observed when conducting the study. These steps involve the key principles such as the research question, methods to address the research problem and the research approach taken in respect with the ethical research practice (Seale, 2004). With the quantitative approach, the study adopted a descriptive survey through the use

of a questionnaire. The descriptive survey produces a descriptive analysis of the data in which the researcher understands the dissemination of each perspective across the survey respondents (Punch, 2004).

The data presentation is based on a descriptive approach, since on the descriptive study; information is normally not manipulated during the data gathering process. A descriptive study is defined as an experimental study in which the data is descriptive. A descriptive study can provide information descriptively on the characteristics of a population under study certainly looking on attitudes, behaviour, among others (Trochim, 2014). This study adopts a descriptive approach to present data gathered on the role of ICTs in implementing development projects. Moreover the quantitative approach to the gives a graphic review on the particular depictions of the quantitative data gathered on the number of development projects facilitated by ICTs. Graphic representation of data is often meant to describe the phenomenon under study (Creswell, 2003). The distribution of questionnaires was likewise necessary for the study due to descriptive nature and helped the researcher to collect direct data from Alice, Middledrift and Beaufort.

3.4 RESEARCH METHODOLOGY

This study employs a mixed method, namely a questionnaire for both qualitative and quantitative research methodology. Qualitative research has been given many names such as “field research critical research, interpretative research, naturalism, ethnography, anti-positivist approach, an alternative approach, and constructivism” (Du Plooy, 2001: 29). It is an interpretive or subjective approach of constructing the qualitative aspects of communication experiences (Du Plooy, 2001). While quantitative methodology is objective in nature, empirical and numerical. Research methodology is a procedure for data collection that a researcher employs to plan, arrange and analyse data scientifically (Bryman, 2001). This study employed questionnaires and focus group discussions as both qualitative and quantitative research methods. The researcher adopted a survey in the form of 120 questionnaires that were distributed in Middledrift, Alice and Fort Beaufort. The researcher opted to use questionnaires because they

retain the identity of the respondent anonymously and give the respondent freedom to express him or herself (Babbie, 2008). Questionnaires as a research method gather large data of information from large number of people within a short space of time and this case they are used to gather data from 120 people. A Survey can be in different forms such as face interviews, telephone interviews and paper questionnaires but this study used paper questionnaires.

The study does not only use a survey but also uses focus group discussions as qualitative research method to collect data on the role of ICTs in implementing the development projects. Focus group research involves the gathering of a small group of participants from six to twelve in order to discuss the research questions for the study (Bhattacherjee, 2012). Focus group discussion is sometimes seen as an interview that involves small groups of respondents and the researcher (Punch, 2013). This study uses focus group to collect a multiple of perspectives from the respondent from Alice, Middledrift and Fort Beaufort on the role of ICTs for development.

3.4.1 Research instrument

A research instrument refers to a tool mostly used for data collection in order to solve a research problem or find a solution to the problem under study (Babbie, 2001). Research tools selected for the study are questionnaires in a form of a survey method and in- depth focus group discussions. These were used to get answers form the respondents on the role played by ICTs in implementing development projects. Descriptive surveys involve four types of instruments, namely self-administered questionnaires, document reviews, interviews and structured observations (Fink, 1995). This study uses self-administered questionnaires to collect data on the role played by ICTs in the implementation of development projects.

3.4.1.1 Questionnaire

A questionnaire can be termed as the instrument that seeks to collect survey information by providing structured data, which can be understood in the absence of the researcher. A questionnaire is “a document containing questions designed to solicit

information appropriate for analysis" (Chikoko and Mhloyi, 1995:96). It can be used to gather information that can be converted into quantitative and qualitative data. It is a mixed technique of collecting data. A questionnaire was used to gather data for the study. The researcher randomly distributed questionnaires to 120 people within the Alice, Middledrift and Fort Beaufort in order to complement the data gathered through focus groups. This means 40 questionnaires were distributed per each selected area.
The questionnaires were distributed randomly across households to bring results that are from a heterogeneous population in order to avoid bias. The researcher distributed questionnaires to different respondents in order to acquire relevant and reliable data. A questionnaire seeks to find out the respondents' attitudes and perspective as it used as a data collection instrument-encompassing checklist, attitudes and projective techniques rating scale (Oppenheim, 1992:100). It can also be used as a mixed method in which data can be used for qualitative and quantitative purposes.

3.4.2.2 Focus Group

A focus group is a research method which is mostly based on qualitative research methodology (Collis and Hussey, 2009). It is whereby a group of people either from between 8 to 12 are asked questions and they discuss and share their perceptions, opinions, beliefs and attitudes towards a certain idea. Participants are free to interact and talk with other group members. Focus groups were used to collect data based on 3 focus groups, meaning one focus group for each selected area. The participants discussed the issues in line with the questions asked on the role played by ICTs for development in Alice, Middledrift and Fort Beaufort.

The researcher used a moderator interview guide to discuss the role played by ICTs in implementing educational and infrastructural development projects. The interview guide consisted of research questions used to give direction to the focus group discussion. Researcher acted as an interviewer while the participants were answering the questions asked by the researcher. The most contributing participants in the focus group discussion showed some understanding of the research questions. Focus group

discussions were more interactive and gave the researcher an opportunity to discuss the aspects under study as well as understanding the respondents' behavior.

3.5. JUSTIFICATION OF THE RESEARCH METHODS

A mini-survey helped the researcher to find information from community members' perspectives on the role played by ICTs on the implementation of educational and infrastructural development in Alice, Middledrift and Fort Beaufort through a questionnaire. Focus groups also assisted the researcher to evaluate community members' perspectives on the role played by ICTs' for educational and infrastructural development in Alice, Middledrift and Fort Beaufort.

3.6 RESEARCH DOMAIN

The study was conducted in Alice, Middledrift and Fort Beaufort in the Eastern Cape Province, South Africa under the Nkonkobe local municipality. Alice, Middledrift and Fort Beaufort are rural towns under the Nkonkobe local municipality. Nkonkobe local municipality was founded in 2000 and is re-organised in Transitional local councils namely Alice, Fort Beaufort, and Middledrift. These are organised in such a way that Alice was positioned as a legislative seat and Fort Beaufort as an administrative seat. The Nkonkobe local municipality is ranked as the second largest municipality since it covers 3 725 km2, and constitutes 16 percent of the Amatole District Municipality's land (Ntsangani, 2014). Nkonkobe local municipality is a rural municipality geographically found along the mountains of the Winterberg IiNtabaseNkonkobe (Ntsangani, 2014).

Nkonkobe has more than 100 villages, 21 wards and councillors. As it is situated in the poor province of the Eastern Cape, communication, development projects and transportation have become the major problems in this municipality (Ntsangani, 2014). Eastern Cape is considered as one the poorest provinces in South Africa. As for Alice town is estimated that the population is approximately between 11,000 and 14,000 people and one third of the population estimated to be younger than 15 years while those aged 60 years and above are ranged at 13% (Ntsangani, 2014).Therefore a study conducted in these areas seems relevant to investigate the role played by ICTs in implementing development projects in such regions.

3.7 POPULATION

Population refers to people, a group or aggregate of individuals, groups, organizations, social objects, or social interactions targeted for the study (Du Plooy, 2001:100). Population is also viewed as sum total of the units of analysis the study (McClendon, 2004). In other words, a population is the people in which a sample for the study is derived and where the findings of the study can be generalized (Latif and Maunganidse 2004). Other definitions of a population note that it is a specified aggregation of elements under study from which the sample for the study is taken from (Babbie and Mouton, 2004).

De Vos et al (2005) view a population as the intended parameters of the study where all measurements for the research are represented. Gray and Moseley (2005) look on the term population in research as total number of elements included in the study. A population can be also defined as a number event, organization units, case records or other sampling intended for the study (De Vos et al., 2005). The population for this study encompasses community members with the relevant information on the role played by ICTs in the implementation of educational and infrastructural development projects in Alice, Middledrift and Fort Beaufort.

3.8 SAMPLING

The definition of sampling is derived from the concept of representation and generalisation for the population under study. Sampling is a process whereby the researcher selects some units or elements of study from a population to become a sample under investigation (Cooper & Schindler, 2003). A sample is regarded as subset of proportions drawn from the population under study (De Vos, 2000). There are two types of sampling namely, probability and non-probability sampling.

Probability samplings are mostly quantitative in nature while non-probability is qualitative in nature. This study, therefore uses both probability and non-probability sampling techniques that is simple random and convenience sampling. The target population of this study are the Alice, Middle drift and Fort Beaufort community

members. The researcher draws a sample from the community members who are conveniently available for the focus group discussions and distributes 120 questionnaires randomly across households.

3.8.1 Sampling procedure

As aforesaid that probability and non-probability sampling procedures are commonly used to sample a large number of respondents just reduce errors, time and costs. Probability sampling notes that members in the populace hold equal chances of being selected for the survey (Cohen et.al, 2007). This means that the questionnaires can be distributed randomly across the populace. There are types of probability sampling, namely simple random sampling, systematic sampling, stratified sampling and cluster sampling (Neuman, 2006). This study employed simple random sampling for a survey in the form of questionnaires as random numbers were given to houses for distribution. A questionnaire was distributed randomly to 120 people across households in Alice, Middledrift and Fort Beaufort, 40 questionnaires for each area. While non-probability sampling ensures that subjects in the population have no equal chance for selection, convenience sampling was used to gather participants for the focus group discussions (Cohen et al., 2007). This was supported by the use of focus group discussions. This means 3 focus groups, all with 8-12 participants were formed conveniently and one focus group for each area.

3.9 DATA COLLECTION

Data collection is a process whereby the research instruments are used to gather data for the study to answer research questions (Cooper & Schindler, 2008). The procedure used to collect data should however be reliable and valid enough to limit and avoid inaccurate data collection because unreliable data can bring invalid results for the study. Hence data was collected from the community members of Alice, Middledrift and Fort Beaufort to evaluate the role played by ICTs in implementing educational and infrastructural development projects. The houses were numbered on a list and houses were randomly picked for questionnaire distribution.

The data collecting methods may differ from one research field to the other but reliability and validity should be achieved. The data collection process was based on quantitative and qualitative forms of approach. This means the researcher used a triangulation technique in order to collect reliable and valid data from the respondents.

3.10 DATA ANALYSIS

Data analysis means interpreting, categorising data into themes and analysing data theoretically to answer research questions (Babbie, 2008). Data that was collected from the survey was captured and coded in the computer using Statistical Package for Social Science (SPSS). The software SPSS is normally used to analyse data since it has statistical and mathematical functions and can be manipulated to handle the data captured in any format (Punch, 2004). The quantitative data on the role played by ICTs in implementing educational and infrastructural development projects in Alice, Middledrift and Fort Beaufort was analysed to present data descriptively in statistical and analysis through tables and graphs. Tables and graphs were used to inform and depict the profile of respondents per criteria reviewed. The graphic presentation of data in the form of tables and charts enabled the patterns concerning the various aspects on the role played by ICTs for development to be visible and clear (Maxfield and Babbie, 2009). Data collected from focus groups discussions was analysed thematically by employing a thematic content analysis in order to evaluate the data from respondents.

3.11 VALIDITY OF THE STUDY

Validity has many definitions; some are used in this study as starting point to the understanding of the validity of the research instruments used. Validity refers to the soundness or the effectiveness of an instrument used to measure what it is supposed to measure (Leedy and Ormrod, 2001; Punch, 2004). Validity can be explained as the credibility and the accuracy of the research instrument or the research findings (Hennink, 2014).The validity of the questionnaire used in this study is its accuracy in covering the research questions or its accuracy in measuring the role played by ICTs in implementing educational and infrastructural development projects. However the misunderstanding of the respondents in answering the questionnaire may produce

some invalidity. When respondents fail to interpret questions and also fail to express themselves, this brings some invalidity on the study (Mahlangu, 1987). The questionnaire was in English and all respondents were expected to answer in English. However, with the focus group discussions, respondents were also allowed to use Xhosa since the researcher understood Xhosa language.

3.12 RELIABILITY

Reliability of the research findings and the research instruments also matters just their validity. The consistency of the measuring instruments and the findings of the study denotes their reliability (Krauss and Miller, 1987; Bryman, 2004). Simply reliability is achieved when the measurement is consistent. In social science research like any other field reliability is the central concept (Punch, 2004). Reliability actually means the consistency of the research results or the measuring instruments under same circumstance though at different times. This means under same circumstances and different times, the extent of reliability of measurement should be consistent (Punch, 2004).

The reliability of the focus group and the questionnaire were deemed consistent since the researcher carried a pilot study before the actual research. Reliable data depends on how data was collected as it remains constant through the data collection process. A reliable sample for the study also determines the reliability of the data collected. If the data is unreliable then the whole study would be void and null.

3.13 ETHICAL CONSIDERATIONS

This study abides by the research ethical rules and regulations both for data collection and respondents' participation. The researcher applied for the University of Fort Hare ethical clearance (see appendix-for a copy of ethical clearance) and collected data after having granted the ethical clearance. Since respondents take part in the research as subjects of the study, the researcher should ensure that all ethical procedures are considered before the data collection (McMillan & Schumacher, 2010). It is the responsibility of the researcher to inform, protect and minimise harm on his or her

sources of information. Observing ethical procedures in research safeguards the both the researcher and the respondents as it ensures the feasibility of the study (Flick, 2009).The research participants were informed of the details the study before they agreed to participate and were asked to sign a confirmation of consent. Participants unwilling to participate we informed to do so.

3.13.1 Anonymity and confidentiality

Anonymity and confidentiality are the ethical principles that should be observed to protect the participants. Anonymity ensures that the participants' identities are concealed and should be revealed in the study against their consent. Confidentiality concerns the right of access to the information provided by participants. The researcher ensured the participants that the data provided by them will confidential in such a way that their identities will be anonymous. It is at the researchers' disposal to ensure that appropriate precautions are considered to protect the participants' details (Adler and Clark, 2007).

3.14 CHAPTER SUMMARY

This chapter discussed the research design, population of the study and research domain, research instruments sampling techniques and procedures. Data collection and data analysis are also explained in regard with the qualitative and quantitative research approaches used for the study. Research design involves the collection of data, the population, the sampling procedures, data analysis, research methods and just to mention a few. This chapter introduced research methodology for the study and the ethical procedures involved in the data collection process.

CHAPTER 4: DATA ANALYSIS

4.1 INTRODUCTION

This chapter discusses the research data found from the survey and focus groups from Alice, Middledrift and Fort Beaufort areas. A survey in the form of a questionnaire was distributed to 120 respondents. Also focus group discussions were carried out in all three areas. This chapter begins with outlining the survey results on the role played by ICTs on educational and infrastructural development in all three respective areas and further looks on the focus group discussions.

4.2 FORTBEAUFORT SURVEY

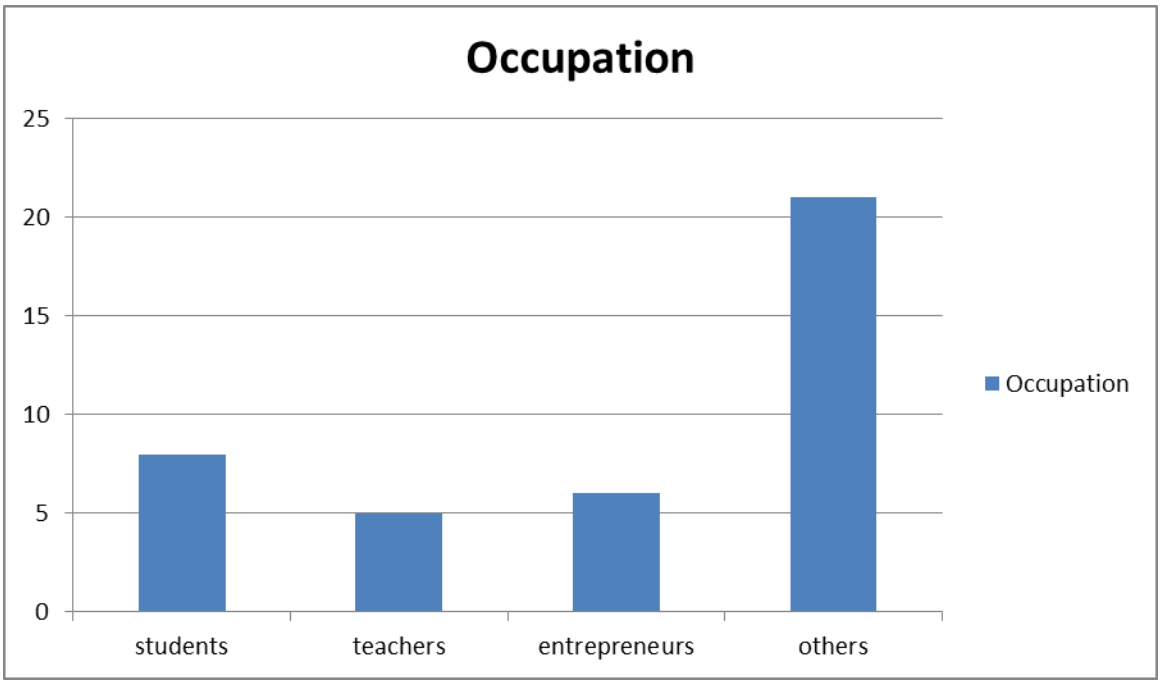
4.2.1 Gender, language and education

Since the 40 questionnaires were distributed randomly across households in Fort Beaufort, 24 happened to be female respondents and 16 were male respondents. This means 60% were females and 40% males. In terms of language, 36 respondents ticked Xhosa as their language and 4 ticked English as their language. It shows that 90% selected Xhosa as their language and 10% English. Amongst the respondents, 3(7.5%) respondents noted that they hold a degree and 5 (12.5%) respondents hold a diploma while20 (50%) respondents have High school certificates. 12 respondents (30%) were others who did not select degree, diploma or High school qualification.

4.2.2 Age and occupation

The 40 randomly distributed questionnaires in Fort Beaufort showed that 8 (20%) were students, 5 (12.5%) were teachers, 6 (15%) entrepreneurs in the business of building, and farming and 21 (52.5%) others who did not choose any occupation in the questionnaire. The survey reflects common occupations in Fort Beaufort as namely teachers, students, builders and farmers. Respondents between the age of 18-25 were 20 (50%), those between the 26-35 were 15 (37.5%) and those who selected the age of 36-45 were 5(12.5%).This means that most respondents were between the age of 18-35.

Table 1: Fort Beaufort- Occupations



4.2.3 Availability and access of ICTs

38 (95%) respondents showed that they have access to ICTs but not all of the ICTs. In Fort Beaufort, the survey showed that 39 (97.5%) respondents have access to mobile phones, 8 (20%) respondents have access to computers, 36 (90%) respondents listen to radio and 28 (70%) respondents have access to television. Also 36 (90%) respondents noted that radio communicates development projects on education, for example HIV/AIDS talks, academic lessons, parliamentary government communications on development.

10(25%) respondents noted that people in the community have access to mobile phones, radio and television but they hardly find access to internet. The survey shows that15% entrepreneurs hardly access the internet but listen more to radio and television. This means that information on educational and infrastructural is more acquired from radio and television by entrepreneurs. 20 (50%) respondents showed much use of a variety of ICTs for educational and infrastructural development projects. All 8 (20%) students, 5 (12.5%) teachers showed that they have access to computers and the internet, phones, radio, television, scanners, printers, photocopiers. Most of them

access the internet at school and work. To a greater extent, students and teachers showed high access and use of ICTs namely computers and phones connected to the internet for research, emailing, and calling and typing, photocopying, scanning and printing.

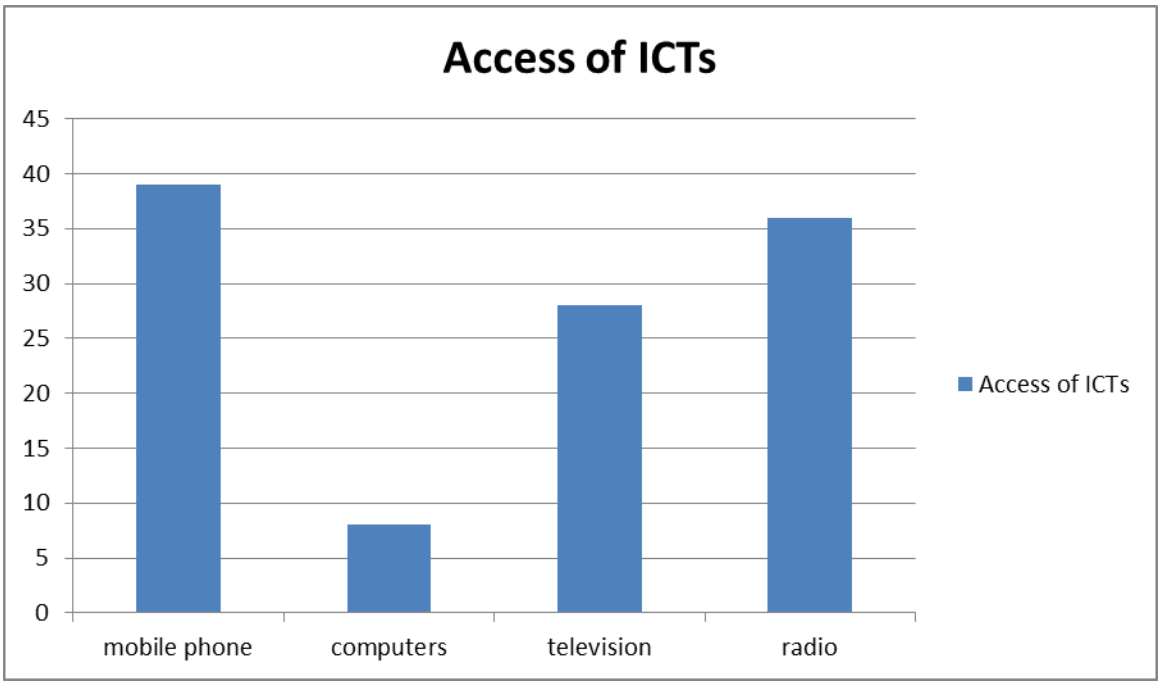


Figure 1: Access of ICTs in Fort Beaufort

4.2.4 Benefit of ICTs

39 (97.5%) respondents noted that they use mobile phones for calling and 19 (47.5%) respondents' further use mobile phones to access the internet. Among the 19 (47.5%) respondents, 10 (25%) respondents ticked that they use the internet either by either the phone or computer for social communication, business communication, and news reading, searching jobs and acquiring educative information.

5 (12.5%) entrepreneurs, namely builders, all noted that ICTs facilitate communication between the Nkonkobe local municipality and contractors. This means Nkonkobe local municipality easily arrange meetings for road construction and RDP houses just by calling builders.

Also 3 (7.5%)builders noted that ICTs such as computers connected to the internet help them to acquire information on the relevant building equipment for their projects, and printers and photocopiers assist in printing and photocopying building plans.

4.2.5 Access to government communication on educational and infrastructural development programmes

25 (62.5%) respondents ticked that they have access to government communication on educational and infrastructural development programmes through radio television and the internet. 15 (37.5%) respondents ticked {No} for not having access to government communication on educational and infrastructural development projects. The same 15 participants highlight that the Nkonkobe local municipality is not transparent on educational and infrastructural development projects.

Among the 25 (62.5%) respondents with access to government communication, 9 (22.5%) respondents noted that Nkonkobe local municipality promote the use of ICTs for educational purposes by donating computers to schools. 7 (17.5%) respondents including entrepreneurs wrote that Nkonkobe local municipality call for workshops were development projects could be discussed as well as providing phones and computers to small business companies.3 (7.5%) respondents noted as farmers highlighted that the municipality communicates agricultural products via ICTs.

Among the 25 (62.5%) respondents with access to government communication,19 participants confirmed that Nkonkobe local municipality have been communicating infrastructural projects like building roads, new municipality buildings to develop the town and as well as offering learnership or internship for the youth. However, 11 (27.5%) respondents noted that Nkonkobe local municipality support development only towards election time.

4.2.6 Constraints

The survey shows that all respondents agree that there is lack of ICT utilisation, lack of resources and lack of access to ICTs .All participants highlighted the need for the

government to educate the general population in the villages how to use ICTs for development as this could help them to utilise the resources. This was evident as 32 (80%) of the respondents are computer illiterate and 20 (50%) only use mobile phones for calling. Only 19 (47.5) respondents use further use mobile phones for social communication, especially on social media, *WhatsApp and Facebook*. Only 1 (2,5%) respondents out of 40 (100%) respondents without a mobile phone.

All respondents ticked on the lack of utilisation, lack of education, lack of access and lack of ICT resources.38 (95%) respondents noted that lack of utilisation is caused by lack of education and lack of access to a variety of ICTs. All respondents highlighted the need to educate villagers about ICTs. Respondents show that villagers listen to radio and understand radio educational programmes. The survey proves that other ICTs, namely computers and the internet are under-utilised.

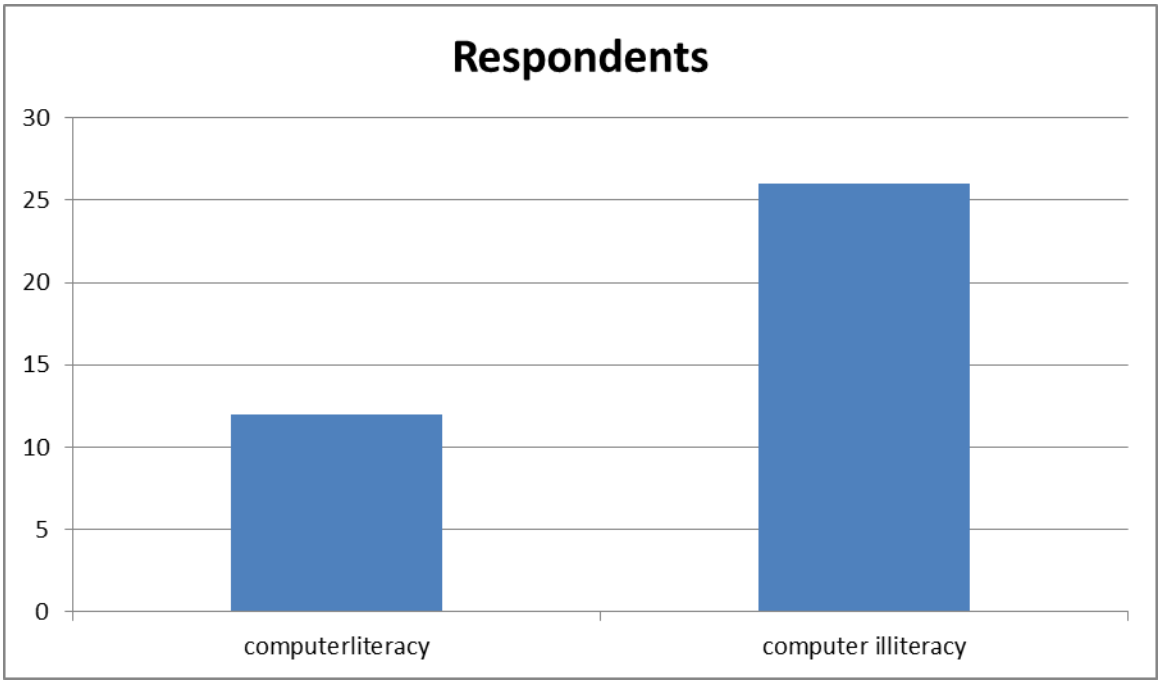


Figure 2 : Computer literacy and illiteracy in Fort Beaufort

4.3 SURVEY ON MIDDLEDRIFT

The Middledrift survey showed similar results with Fort Beaufort but there are some slight differences. Like Fort Beaufort a rural village, Middledrift community is also under Nkonkobe local municipality. Participants show economic and social class differences, for example teachers, students, entrepreneurs and others, who seem to be less educated.

4.3.1 Gender, language and education

In Middledrift, 22 (55%) were male respondents and 18 (45%) female respondents. The 40 distributed questionnaires reflected that 28 (70%) respondents ticked on Xhosa language as their language and 12 (30%) respondents ticked on English language. Among the respondents, 2 (5%) respondents ticked that they hold a degree, 8 (20%) participants ticked on diploma and18 (45%) respondents hold High school certificates. 12 (30%) respondents ticked on other, meaning they hold no degree, diploma or high school certificate.

4.3.2 Age and occupation

Like in Fort Beaufort, respondents have different occupations but many respondents identified themselves as teachers, students, entrepreneurs namely builders and farmers and others. The survey in the form of 40 distributed questionnaires in Middledrift showed that 12 (30%) were students, 7 (17.5%) were teachers, 10 (25%) entrepreneurs in the business of building, and farming and 11 (27.5%) respondents who ticked on other, meaning they are not students, teachers and entrepreneurs.

Respondents between the age of 18-25 were 25 (62.5%), meaning the survey had the youths as the majority. Respondents between the age of 26-35 were 10 (25%) while respondents at the age of 36-45 were 5 (12.5%). Respondents at the older age were outnumbered by the young people. The rural Middledrift shows a large population of respondents marked between the age of 18-25 years.

The survey shows that the youths between the ages of 18-25 and 26-35 are more oriented with ICTs than those from the age of 36 to 45. Young people are more oriented with internet and computers. Students were the most respondents that make use of a variety of ICTs such as computers, photocopiers, printers amongst others.

4.3.3 Availability and access of ICTs

Respondents, namely 12 (30%) students and 7 (17.5%) teachers marked that they have access to computers, mobile phones, radio, television, printers, photocopiers, fax machines as well as the internet, where they often do their academic research. All respondents noted as students and teachers ticked that they have access to government communication programmes through the internet. These respondents further ticked that they access computers and internet at school or work.8 (20%) entrepreneurs and 6 (15%) others ticked that they access internet through mobiles phones. Only 15 (37.5) respondents notified to have access to computers.

The survey in Middledrift shows that 39 (99%) respondents at least possess a mobile phone. The survey also reflect that 22 (55%) of the respondents use their simple mobile phones only for calls and 18 (45%)respondents use their mobile phones to call and access the internet. Also respondents with access or who listen to radio were 37, meaning it is 97.5% radio listenership and 30 (75%) respondents who often watch television.

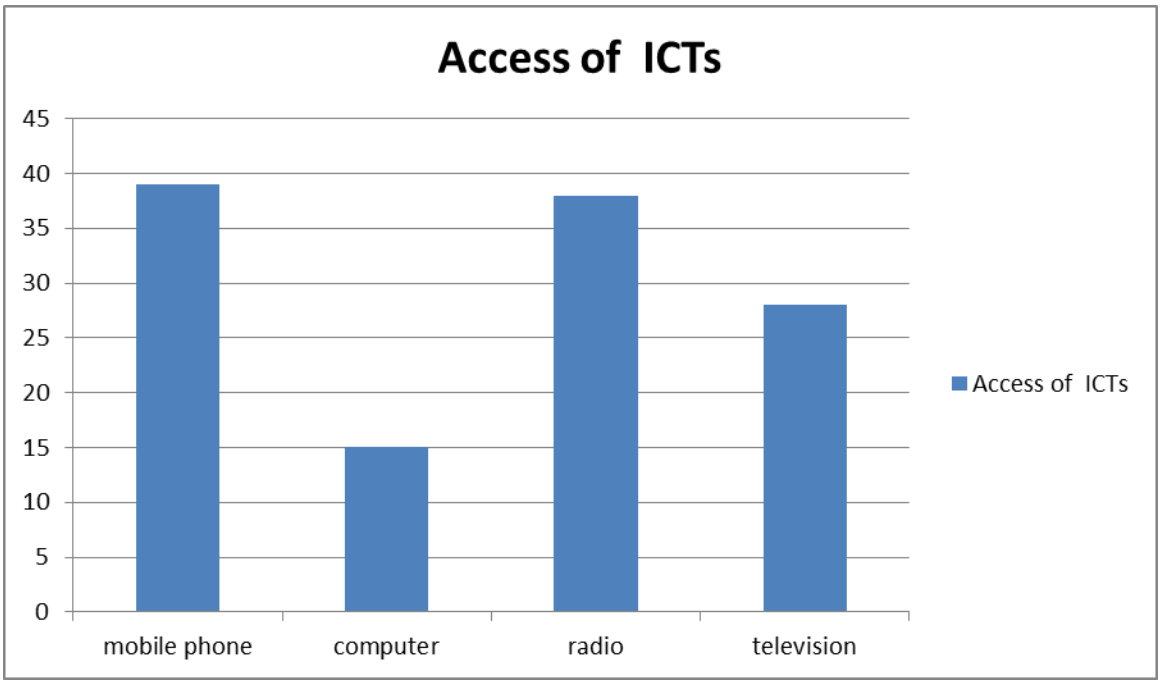


Figure 3: Access of ICTs in Middledrift

4.3.4 Benefits of ICTs

19 (47.5%) respondents noted that they use the internet for several reasons such as social communication, news reading, to acquire academic information, to find employment opportunities, to market and run their businesses.22 (55%) respondents ticked that they use ICTs to connect themselves with the rest of the world. All respondents showed that they use mobile phones for calling relatives, and friends and 17 (42.5%) respondents use mobile phones for business communication.

Also 6 (15%) respondents highlighted that ICTs have been facilitating the coordination and communication in the building of roads and houses. Radio was singled as giving more information on infrastructural development through community development programmes.

4.3.5 Access government communication on educational and infrastructural development programmes

The survey shows that 23 (57.5%) respondents have access to government communication on educational and infrastructural development programmes. 35

(87.5%) respondents noted that they access government through radio and television. Only 10 (25%) respondents have access government programmes through the internet. The survey shows that 12 (30%) respondents agree that the Nkonkobe local municipality is supportive in seeing that ICTs benefit the people of Middledrift by providing computers to schools around the area.

Like in Fort Beaufort, 8 (20%) respondents noted as entrepreneurs approve that the municipality usually call for workshops where people are taught about community development and ICTs. The survey also brings out that the municipality promotes the availability of community radio. 37 (92.5) respondents wrote that radio provides educative information on community development, academics, health awareness programmes and employment opportunities.

4.3.6 Constraints

All respondents ticked on lack of ICT utilisation, lack of resources and lack of access as the main constraints to development by ICTs.35 (87.5%) respondents highlighted that Middledrift community experiences poor network. The survey shows that poor network makes participants to rely more on radio and television for educational and infrastructural information. All respondents wrote that the government should promote ICTs for development in the communities. 23 (57.5%) respondents noted that there should be computer labs in the rural areas.

All respondents ticked on ICT lack of access, lack of education, lack of sufficient utilisation and lack of resources. As noted 35 (87.5%) respondents highlighted that there is lack of sufficient network for internet. This means respondents have less access to internet. 8 (20%) respondents also showed that there are some places in Middledrift where network is very poor. Also 13 (32.5) respondents highlighted that network companies should improve the availability of network as this affects communication.

4.5 ALICE SURVEY

Alice involves a diverse demography of villagers, students, lecturers, entrepreneurs, builders, famers and others. The area has a University, the University of Fort Hare and Lovedale College. Alice town just like Fort Beaufort has shopping centre, where people have access to few shops such as Shoprite, Spar and just to mention a few. It is a rural town under Nkonkobe local municipality.

4.4.1 Gender, language and education

The survey in Alice shows that there were 16 (40%) male respondents and 24 (60%) female respondents. The survey in the form of 40 distributed questionnaires show that 34 (85%) respondents ticked on Xhosa language and 6 (15%) respondents ticked on English language. On education, respondents who hold a degree were 10 (25%), 5 (12.5%) respondents ticked on diploma as their education level while 15 (37.5%) ticked on High school level and 10 (25%) respondents were others, namely without a degree, diploma or high school qualification. The survey shows that the respondents with degree certificates were more in Alice than the respondents in Middledrift and Fort Beaufort.

4.4.2 Age and occupation

In Alice, the survey on occupation shows that 12(30%) were students, 10 (25%) were teachers, 8 (20%) entrepreneurs in the business of building, and farming and 10 (25%) other whose occupations were not available. This means respondents as students were more compared to other occupations. On age, the survey shows that those between the age of 18-25 were 20 (50%), respondents between the age of 26-35 were 13 (32.5%) while respondents at the age of 36-45 were 7 (17.5%). Respondents between the age of 18-35 were more than those between 36-45.

4.5.3 Availability and Access of ICTs

In Alice, 20 (50%) respondents identified students, teachers and entrepreneurs noted that they have access to ICTs such as computers and the internet, radio, television, photocopiers, printers, scanners and fax machines. This means that academic

institutions promote students' access to ICTs. These marked that they access internet school and work and only 7 (17.5%) respondents who showed that they access internet at home. All respondents highlighted that they possess mobile phone.

Not all respondents that access the internet through the computer.13 (32.5%) respondents ticked that they use their mobile phones to access the internet.15 (37.5%) respondents noted that they have no access to internet and cannot afford computers. The survey shows that 10 (25%) respondents only use mobile phones for calls. This means25% of the respondents access the internet using cell phone. Among the 10 (25%) respondents, some use mobile phone for business communication.

The survey shows that there are 34 (85%) respondents with access to radio. The survey also shows that radio listenership is high. Also 30 (75%) participants have access to television and indicated that radio and television are the most accessible ICTs.

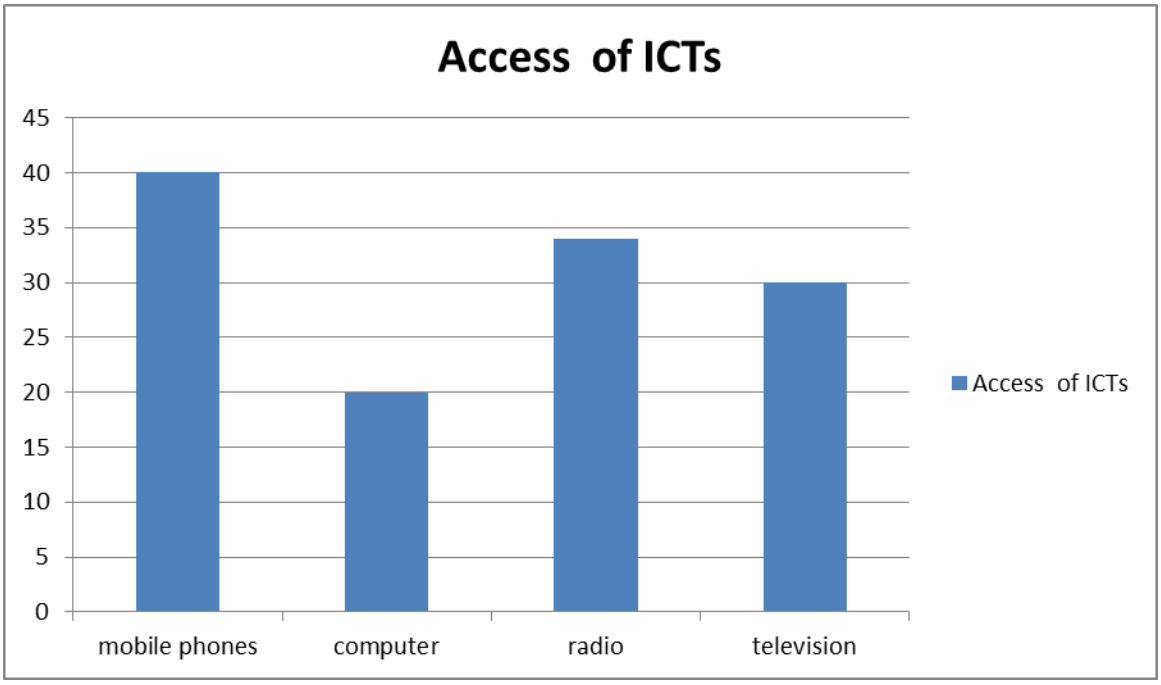


Figure 4: Access of ICTs in Alice

4.4.4 Benefits of ICTs

Like in Fort Beaufort and Middledrift, 34 (85%) respondents in Alice note that they receive more of educative information through radio and television. These also ticked that radio provides academic information events, community development programmes, health awareness programmes and infrastructural development programmes.

12 (30%) students and 8 (20%) teachers commonly marked that the internet provides them with educative information. These highly use the internet for emailing, academic research, access government communication programmes, news reading and social communication.21 (52.5%) respondents marked that they also print, scan, photocopy as well as attach or fax documents.

All respondents noted that mobile phones facilitate communication. 4 (10%) respondents notified as builders wrote that mobile phones assist in coordinating meetings or workshops. The survey shows that entrepreneurs use mobile phones often for business communication.

4.4.5 Access to government communication on educational and infrastructural development programmes

11 (27.5%) respondents noted the Nkonkobe Local municipality supports community development. These participants noted that they are aware of Nkonkobe local municipality educational and infrastructural development programmes through ICTs. 8 (20%) respondents highlighted that NEDA provides ICTs to small business entrepreneurs, donating computers to schools and offering bursaries to students.

24 (60%) respondents wrote that the Nkonkobe local municipality has being non-transparent on development programmes. The survey shows that there has been lack of information between the municipality and the community. 29 (72.5%) respondents highlighted they access government programmes on educational and infrastructural development projects through radio. Hence 11 (27.5%) respondents noted that Nkonkobe local municipality should give more information on their programmes using

radio. 39 (97.5%) of respondents wrote that the government should provide ICTs for development.

4.4.6 Constraints

All respondents highlighted on the issue of lack of education, lack of ICT utilisation, lack of resources and lack of access as the cause behind the deficit use of ICTs for educational and infrastructural development. All respondents also ticked lack of education, lack of ICT utilisation, lack of resources and lack of access as a challenges against ICTs for development. 4 (10%) respondents wrote that the government should provide free internet for everyone and reduce costs on internet bundles. 9 (22.5%) respondents noted that the government should provide educate the community about the importance of ICTs.

Also 34 (85%) respondents highlighted that the government should build ICTs facilities to promote educational programmes, connect the community to the world, and facilitate the access for infrastructural equipment, helps in informing the youth on job opportunities. The survey shows that educating Alice community members would increase ICT use and utilisation.

4.6 FOCUS GROUP DISCUSSIONS

The focus group discussions raised more or less the issues discussed above. This approves the reliability of the research data. Three focus group discussions were fostered, one for each area, Alice, Fort Beaufort and Middledrift. The focus enhanced the study by giving qualitative information on the role played by ICTs on educational and infrastructural development.

4.6.1 Alice focus group

Alice focus group consisted of 12 participants, 7 females and 5 males, who discussed more on the educational and infrastructural development projects taking place in Alice. Issues highlighted include the donation of ICTs, namely computers to schools in Alice, promoted by Nkonkobe Economic Development Agency (NEDA) and the alumni of the

University of Fort Hare. Organisations involved in promoting development Alice include the Local Economic Development (LED), NEDA. These have been carrying on workshops on educational and infrastructural programmes such as tourism infrastructure, skill training and business development by providing ICTs to small business entrepreneurs (SMMEs).

ICTs were noted as facilitating communication on infrastructural development projects between the governmental departments and the Nkonkobe local municipality. Road development, for example was singled out as being made possible through communication between the Nkonkobe local municipality and the department of the government, namely the Eastern Cape Province department. One participant said that "Inventive ideas are learnt and communicated in order to benefit the marginalised, poor rural areas."

On the other hand, participants answered that Alice faces challenges to access basic ICTs. One participant hinted that

> "The government has a mandate to ensure that people have access to ICTs in order to better their lives by connecting themselves to the rest of the world to acquire educational information."

4.6.2 Educational and Infrastructural projects in Alice

One participant noted that there has been much educational and infrastructural development in Alice driven by the Alice Regeneration programme. The Alice Regeneration programme was highlighted as one of the programmes that have led to the growth of infrastructural development and educational facilities. Educational facilities were further developed since 2000 at the University of Fort Hare, Lovedale College and Fort Cox. ICT equipment such as computer laboratories was introduced just to make it possible for students to access internet. A participant noted that

> "Students' access to computers and internet is purposed to educate them and make them acquire necessary information for their academics."

This could be the reason why the survey in Alice proved that many participants with access to computers and internet are students and teachers. Other participants informed that the growth of Alice into a University town is purposed to attract students from different environments. However the objective of making Alice a university town has not been totally achieved since this involves a lot of infrastructural development. ICTs were recommended as playing a greater role in providing the government, Nkonkobe local municipality and all stakeholders with innovative ideas. The Alice Regeneration programme was seen as an initiative that could promote infrastructural and educational development but effective communication through ICTs to complete the programme remains essential.

4.6.3 Educational projects supported by the Nkonkobe local municipality

It was noted that the Nkonkobe local municipality promoted the upgrading of educational facilities by providing computers to different schools which led to the building of computer laboratories. Nkonkobe local municipality also promoted the training small scale entrepreneurs by providing ICTs such as cell phones and computers as well as providing online education. One participant said

> "ICTs were offered to several entrepreneurs and we were connected to big scale companies"

One participant informed that the municipality aims to improve telecommunications, facilitate investment by protecting tourism sites and establish good roads.

4.6.4 Challenges faced

Participants raised so many challenges faced by the community members pertaining to the utilisation of ICTs for educational and infrastructural development. These include lack of education by the majority in the rural community, lack of sufficient information on educational and infrastructural development; many people do not have access to ICTs such as computers. A participant highlighted that

> "Even if many villagers had access to computers, they would need to be taught how to use them since many are computer illiterate."

Participants noted that a cell phone was the easiest ICT to use for calling and many uneducated villagers have access to cell phones. However those with smart phones have access to internet but these are found among the youth or those assumed as literate. Since many have no access to internet and computers, therefore few could make use of printing, photocopying, scanning and emailing unless someone does it for them if the need arises.

Radio, namely *Forte FM* was perceived as accessible, educative, and informative since its content is broadcasted in the local language, *Xhosa.* English is the second language for many who are less educated to fully understand information disseminated in English. Television also plays an important role in informing and educating the rural community members since it visualises the educational and infrastructural development happening nationally and internationally. Especially DSTV channels were noted as benefiting the viewers, academically, socially, religiously, economically, politically, including all factors that can influence educational and infrastructural development. However few villagers were perceived as having DSTV in their houses.

4.6.5 Fort Beaufort Focus group

The Fort Beaufort focus group also consisted of 12 participants, 8 males and 4 females, confirmed that ICTs were promoting educational and infrastructural development but their effectiveness in the community is affected by the lack of utilisation and access. As aforesaid Fort Beaufort is a rural community that needs much of educational and infrastructural development. Fort Beaufort benefits from the ICT availability within and outside the community as well as from other developments that takes place in other nearest areas under Nkonkobe local municipality.

Fort Beaufort witnessed the growth of the shopping centre, the availability of Shoprite, KFC and other national retail brands, one participant shared that ICTs have been playing a role in connecting or developing the community to become like other developed areas in the nation. Other than depending and travelling to other areas in order to access technological privileges of processing money transfers. Community

members can access shops like with Spar, Shoprite that have technological access to process money transfers.

Technologically, ICTs were seen as facilitating communication unlike years ago when people could struggle to communicate with those far away from them. One participant highlighted that,

> "before we used to depend on writing letters and posting which could take days to reach the recipient, but with cell phones and internet, one can communicate spontaneously, effectively within a short space of time without the need of physical movement."

4.6.6 Educational development in Fort Beaufort

Participants identified as students revealed that they have access to computers and internet at school. Some of them are enrolled with the University of Fort Hare, Lovedale College and Fort Cox, which means the community benefits from educational facilities that in nearest areas under Nkonkobe local municipality. Most of the youth were perceived as getting oriented and connected to the global world through the use of ICTs such as mobile phones and computers connected to the internet. Social applications such as *WhatsApp* were described as reducing costs for dialling rather one can discuss educational and business in writing. Participants noted that social media integrates the youths and make them acquire educational information by learning from others in different environments.

Radio was again emphasised as very educative with relevant educational programmes broadcasted in local language by *Mhlobewenene* radio station. Participants confirmed that they do listen to radio in their private cars, public transport, at their homes, from their mobile phones and even online. Radio was marked as one of the ICTs easy to access and use.

4. 6.7Challenges faced

Just like Alice and Middledrift, participants agreed that education was a necessary factor to achieve the full utilisation of ICTs for development. People should be taught on the importance and use of ICTs. Some participants approved that one could be having access to phones and computers but would not know how to use them for his or her own development. Another participant said that

> "Those with computers or smart phones only know how to play music and other functions but not using the ICTs effectively for research or manage necessary software's."

Therefore, it was noted important to educate community members so that they utilise ICTs effectively for educational and infrastructural development. One insisted that the government should build ICT facilities such as telecentres for people to have access public access to computers and internet. Those who are computer literate but without computers, visit internet café that make them pay for using the internet. Respondents perceive this as expensive as it demands one's computer literacy to acquire the information from the internet.

4.6.8 Middledrift Focus Group

The participants in Middledrift were also 12, 5 females and 7 males, who had different perspectives on the role played by ICTs for educational and infrastructural development. Many of them acknowledged that ICTs do play a greater role in the implementation of educational and infrastructural development but this was not so in Middledrift. ICTs were portrayed as playing a lesser role in the implementation of educational and infrastructural development because very few people have access to the variety of ICTs. Many community members were perceived as possessing a cell phone but not a computer which would require one to connect to internet.

Participants who showed much appreciation and utilisation of a variety of ICTs were students and teachers. Few builders, farmers, entrepreneurs have access to internet. Participants acknowledged that many villagers are poor that they cannot afford to buy a computer when they also struggle to afford a cell phone. To access internet is expensive

for many community members. Lack of education was noted as a barrier to development by ICTs.

4.6.9The role played by Accessible ICTs

Participants highlighted areas in which ICTs have been playing a greater role. These include social development through educating the community on health awareness programmes. Radio and television were largely perceived as contributing more educative information. One respondent said that “I learn a lot from ICTs such television because I can view fashion adverts and hair dressing.” This participant owns a hair dressing salon, but she acknowledged that she learns a lot from fashion individuals online and on television.

The upgrading of roads in Middledrift was perceived as a positive development facilitated by ICTs such as cell phone because workers can communicate. One participant said that

> “the greatest invention was the development of a cell phone which makes life easier for many people by minimising distance between people through can communication.”

Rural people can easily communicate with those in urban areas who often take care of them. ICTs were perceived as having transformed the world, to a global world just by being able to connect people in different places.

4.7 CONCLUSION

This chapter discussed the research data collected from three different, Alice, Middledrift and Fort Beaufort under Nkonkobe local municipality. The survey showed that ICTs play a certain role in the implementation of educational and infrastructural development. What determines the role of ICTs in implementing educational and infrastructural development is the utilisation of the resources, access to the ICT resources and education? It is evident that many students, teachers and other educated respondents for both the survey and focus group showed that they have access to a variety of ICTs including computers. Other respondents showed that they do not have access to a

variety of ICTs but only possess a cell phone for calling. Many respondents do listen to radio and television. The researcher confirms that educational development has been a factor behind the infrastructural development in areas like the Alice, where the objectives of transforming the place into a University town are being pursued. Innovative ideas are diffused through ICTs to rural areas like Alice, Fort Beaufort and Middledrift.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

5.1INTRODUCTION

This study discusses the role played by ICTs on the implementation of educational and infrastructural development projects in Alice, Middledrift and Fort Beaufort. It looks closely at the impact of ICTs on educational and infrastructural development projects. This chapter also covers the discussion of the research findings, a summary on major themes from the study, main conclusion of the study, recommendations of the study and suggestions for further research.

5.2 SUMMARY OF THE FINDINGS OF THE STUDY

The perspectives of the respondents both for the survey and focus group, reflected mixed observations on the role played by ICTs in their communities. As emphasised in chapter 4, Alice, Middledrift and Fort Beaufort communities have people with different social classes and this means that some have greater access to ICTs than others. Lack of access to ICTs, therefore comes as a main challenge to educational and infrastructural development in the areas. Below are the key findings for the study on the role played by ICTs on the implementation of educational and infrastructural development projects.

5.2.1 Communicating educational and infrastructural development

In different forms of communication, ICTs have been viewed as media of communicating educational and infrastructural development projects, amongst others**.** For instance, mobile phones are widely used to communicate and are seen as reducing distance as well as physical barriers. In addition**,** participation in development projects with the ICTs available for communication seems viable. This is evident in the fact that workshops, community meetings and development projects can be easily arranged at the availability of ICTs. This supports the findings of Morales-Gómez and Melesse (2010) who mentioned that ICTs have also facilitated interaction among business organizations, facilitated human development and set the global community more interactive.

Looking at the findings of this study, with a variety of ICTs used to communicate educational and infrastructural development projects, some of the respondents were of the view that community development projects are largely communicated through various ICTs. For instance, radio plays a greater role because it is seen as widely accessed. Radio is largely used to communicate educational programmes, health awareness programmes, government educational and infrastructural projects and community development programmes. Innovative ideas communicated through radio and television reaches a majority of people in Alice, Middledrift and Fort Beaufort where many people have access. The assertion that radio and television are the most accessed ICTs confirmsthe findings of Eltzroth and Kenny (2003) that ICTs such as radio and television have been commonly used in developing countries with 80% of the populace listening to radio almost weekly.

5.2.2 Connecting people locally and globally

Another interesting finding from this study is that the internet has provided a variety of advantages to communicate, learn, socialise and network with people in other places. Morales-Gómez and Melesse (2010) support this by noting that ICTs have contributed to the fast information consumption, hence creating the world into a global market place. This is evident, given the fact that respondents, especially those in the category of students, benefit much more from the internet. The survey also found out that most of the youth aged from 18 to 25, are well oriented in social media networks. These social networks such as WhatsApp, Facebook, Twitter, and Instagram connect rural people with the rest of the world hence they learn from those who are in developed places. This means ICTs adds a social component to the community in which educative information can be transmitted and which then adds to their development.

This study has also established that innovative ideas are transmitted from urban developed areas to rural areas. In fact, computers play a greater role in the academic circles as students, teachers, entrepreneurs, builders and farmers are able to type, print, email, research on internet and create databases.This partly, supports the findings of Geary, Mahler, Finger and Shears (2005) that in developing countries,

internet use is mainly based on emailing and finding information. Also implies thatcomputer and computing has increased the level of production in the workplace. This is also supported by Colecchia and Schreyer (2002) that the productivity improvement brought by ICTs was associated with the growth contribution based on investment facilitated by ICTs at workplace.

The views of the participants have also established that participatory development whereby a community or group of people are gathered to accomplish a certain development agenda becomes possible with the aid of ICTs. Community meetings on educational and infrastructural development projects can be arranged through *WhatsApp* group discussions, or printing out a poster as well as following up with direct calls. This therefore helps to facilitate development projects even in rural areas.

5.3 EDUCATIONAL AND INFRASTRUCTURAL DEVELOPMENT PROJECTS

ICTs such as radio has been playing a greater role in educating people on infrastructural upgrading, extending of the RDP houses, self-development and community development.The internet, radio and television were mentioned as essentially providing rich educative information. Participants with television subscribed to DSTV noted that some DSTV channels are educative and one can learn physics or mathematics on television. This is in line with the findings of Clarke (2002), who said thattechnological advantages for education in the twenty-first century have gained prominence among the users.

Other participants highlighted that television provides live parliamentary proceedings in which they get to inform themselves about national issues. The parliament members debate national issues that affect people hence television plays an essential role by providing platforms for debates and discussion on development initiatives. Television promotes educational development in Middledrift by promoting educational programmes, connecting the community to the world, helping informing the youth on job opportunities and promoting health awareness programmes.

Radio was also singled as the effective ICT that has a wide listenership in Middledrift. Community radio such as *Forte FM* broadcasts in local language, *Xhosa,* has a wider listenership among both educated and uneducated. Some educational development programmes are communicated in *Xhosa* and this brings more understanding. Radio has therefore been playing a greater role in informing and educating the villagers about health awareness, national issues, national current affairs, academic issues and other community development matters.

5.3.1 Community development

Community development is reflected as having been a subject matter on community radios such as *Forte FM* and education being one of the essential development factors. Educational programmes on health awareness, student funding, anti-crime programmes, just to mention a few are seen as intended to build the community. Respondents' views show that health awareness programmes, community building projects, agricultural development projects, anti-crime projects and building of low costs houses are all communicated through radio, television, internet and more especially through mobile phones as direct communication.

Respondents noted that the main road to King William's Town and East London has been going through an upgrading process with ICTs playing a key role in facilitating the road construction process. ICTs in this respect therefore play a greater role in communicating government development programmes to the people as this is evident in the fact that road users were well informed by the Nkonkobe local municipality about the construction and the alternatives involved. Infrastructural development projects happening in other regions or provinces could also be communicated to other regions through ICTs. These community development projects extend to the involvement of local government's donation of computers to primary schools, secondary schools and tertiary institutions such as Lovedale College which ensures their development.

5.4.2 Rural Development Programme (RDP)

Some respondents highlighted the role played by ICTs in implementing the Rural Development programme. The Rural Development Programme has been promoting infrastructural development, namely the building of houses, roads and business centres. ICTs such as mobiles phones have been of much use in facilitating communication among the contractors as well as communication for arranging meetings by government and community members. The Nkonkobe Local Municipality has been promoting the rural development programme by coordinating a society of builders and providing ICTs such as mobile phones to facilitate the communication. This shows that mobile phones play a greater role in facilitating communication for development programmes as well as its monitoring and evaluation.

5.4.3 Alice Regeneration Programme

Alice regeneration programme is signified as one of the programmes that have been promoting educational and infrastructural development for the benefit of the people of Alice, Middledrift and Fort Beaufort. The objectives of the programme rely much on ICTs for development. ICTs such as computers were donated for student development. It is noted that there have been much of infrastructural development to accommodate computers, printers, just to mention a few. University of Fort Hare and Lovedale College have benefited from this development and thus witnessed the growth of educational facilities. The computer laboratory called *Greathall* was extended at the University of Fort Hare just to increase equal access to internet by students and wireless internet was introduced also in all residences. Respondents identified as students in the survey showed that they have much access to internet and benefit a lot from the internet outlets and that this has contributed immensely to their development.

Participants noted that the Alice regeneration programme is still on-going and its objectives have not been accomplished as yet. However, the initiative of the programme necessitates the promotion of educational and infrastructural development. ICTs have therefore been the catalyst for the Alice Regeneration programme. In several occasions, the Nkonkobe local municipality, NEDA, ASPIRE and other stakeholders have been

involved in the Alice Regeneration programme by promoting the upgrading of educational facilities and donating computers to different schools in Alice, Middledrift and Fort Beaufort. Respondents highlighted that the Nkonkobe local municipality normally holds educational workshops on the relevance of ICTs, and also donates computers and cell phones to entrepreneurs.

5.5 CHALLENGES INVOLVED WITH ICTS FOR DEVELOPMENT IN ALICE, MIDDLEDRIFT AND FORT BEAUFORT

The researcher noted that ICTs still play a lesser role for other people in Alice, Middledrift and Fort Beaufort because of a multiple of challenges such as lack of utilisation, lack of education, lack of resources and less understanding of ICTs.

5.5.1 Education

The first challenge identified on ICTs for educational and infrastructural development in Alice, Middledrift and Fort Beaufort was lack of education. Respondents showed that a majority of the villagers are non-educated or less educated. Education was noted as the first essential thing that villagers should acquire for them to be able to utilise ICTs such as computers and the internet. One respondent informed that the municipality aims to improve telecommunications and also facilitate investment by protecting tourism sites and establish good roads with ICTs playing a prominent role in the process. These in many ways highlight the key role that ICTs play in the development initiatives.

Ninety per cent of respondents highlighted that most villagers are computer illiterate. Educating them would require the building of computer centres or telecentres, where villagers would access free computers and internet. This supports the findings of Tongiaet al. (2005), who mentioned that South African rural population have limited access to ICTs such as computers.Some respondents noted that people need to be taught the importance of ICTs for development. This means that knowing the use of ICTs would also increase the utilisation of these ICTs and especially for development processes.

5.5.2 Lack of resources

The survey showed that few participants have less access to computers and internet. The rural people are perceived to be disadvantaged and cannot afford some of the ICTs such as computers and internet access. This supports the findings of Halewood and Kenny (2010:172) who mentioned that in developing countries, only “47 per 1,000 people” has access to computers and the large number of households in developing countries has “no fixed internet access”. Agreat number of participants with access to computers and internet seem to be students and teachers at the University of Fort Hare in Alice and a few others at work. These are the ones who have most of access to computer, printers, scanners, photocopiers and internet.

Most respondents noted that accessing the internet is expensive for the villagers, who even struggle to purchase airtime to call friends and relatives. The most accessible ICT is radio while television is also accessible but not all can afford it. Respondents highlighted that the government should provide free internet for everyone such as wireless internet and also build telecentres for the people to further improve people’s access to ICTs. The general belief is that increased access will further improve development.

5.5.3 The unavailability of telecentres

Most participants from survey in Fort Beaufort, Middledrift and Alice have no access to the internet. This was portrayed as due to the lack of computers connected to the internet and telecentres to improve the availability of resources. A 20% of the respondents who have access to the internet, mostly access it either at school or work. The community has very few private internet cafes. Participants point out that the Nkonkobe local municipality should be held accountable for the lack of internet resources in the community.

Participants noted that the government should invest in ICTs for development especially in the villages where people need access to educational and infrastructural information. Most of the participants do not have access to the governmental communication

programmes on educational and infrastructural programmes and blames the Nkonkobe local municipality for lacking transparency and not making information available enough. This confirms the findings of Galperin (2010) that in developing countries ICTs are not fully accessed. Hence their response was that the municipality should promote ICT centres, deal with the lack of resources, and urge the government to provide free internet in order to be able to communicate with the community. The general belief is that the provision of telecentres would ensure development and also enhance the successful implementation of development projects.

5.6 MAIN CONCLUSION OF THE STUDY

This study used a survey in the form of a questionnaire and focus groups to evaluate the respondents' perspectives on the role played by ICTs in implementing infrastructural and educational development projects in Alice, Fort Beaufort and Middledrift. Respondents gave a multiplicity of perspectives depending on their experiences and livelihood. Participants were drawn from a heterogeneous population, a people with different occupations. These include students, teachers, builders, farmers, entrepreneurs and others.

Participants confirmed that ICTs play an important role in educational and infrastructural development projects but there are challenges with regard to their accessibility and utilisation. Radio is the outstanding ICT that reaches a lot of people in Alice, Fort Beaufort and Middledrift compared to other ICTs. Respondents are of the view that radio mostly disseminates educative information on health awareness, community development, informs on national development programmes supported by the government, and informs on parliamentary proceedings and many more developmental programmes.

Television is the second mostly used ICT that informs people on educational and infrastructural programmes. Like radio, respondents noted that locals can listen and watch developmental programmes. Television was singled as the most ICT that provides academic lessons to students on a variety of subjects such as Chemistry,

Mathematics and Physics. Infrastructural development such as RDP (Rural Development Programme) is also promoted on television.

Many participants, namely students and teachers were of the view that the internet promotes educational programmes. These have access to computers and carry out academic research on the internet. This means that computers and internet play a crucial role in academic circles. Respondents notified as students informed that computers are of much help because they use them to type assignments, print, photocopy, scan and send emails, which in many ways are beneficial to their development.

Having discussed the above, the researcher concludes that ICTs play a crucial role in enhancing development. However, ICTs in Alice, Middledrift and Fort Beaufort are not greatly understood yet for educational and infrastructural development. The respondents' perspectives reflect that a majority of villagers do not know how to use computers. Only the educated can utilise ICTs such as computers, printers or scanners. However, some ICTs such as Radio or television seem to be accessible. It must also be noted that educational and infrastructural development projects lag behind due to lack of resources, lack of education and utilisation for the ICTs.

5.7 RECOMMENDATIONS FOR THE STUDY

Looking at the findings of this study, the researcher recommends that the government work on strategies to ensure that villagers have access to ICTs for their own development. For instance, in Middledrift, Fort Beaufort and Alice, the government should build telecentres to ensure people's access to ICTs. This is because telecentres will no doubt provide equal access to computers and internet to all villagers, for instance entrepreneurs who had no access to ICTs could find an opportunity to use telecentres.
In addition, a lot has to be done to provide ICT education to the under-privileged that are computer illiterate. The government should also ensure that people have access to a variety of ICTs for the people's own development and these ICTs should be fully accessed and utilised.

To increase the use of ICTs for development, government and other organisations should donate more ICTs to schools, entrepreneurs, builders, farmers and others to enhance their growth and development. In addition, free internet should be made available for all. For instance, the government should provide free wireless internet. Rural areas should also not lag behind on information consumption for infrastructural and educational development projects.

5.8 LIMITATIONS OF THE STUDY

This study only focused on educational and infrastructural development projects facilitated by the ICTs. The study could have focused more on the social aspect and other sectors but all aspects could not be covered in one study. Also the sample used for the study could have limited the study due to the fact that more than 120 questionnaires could have been distributed. A bigger sample could have been useful to acquire more valid data but this was not possible due to time and financial constraints

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APPENDICES

FOCUS GROUP DISCUSSION GUIDE

(1) What do you understand about Information and Communication technologies?
(2) What role do you perceive Information and Communication technologies can play in development programmes?
(3) Has these Information and Communication technologies helped in any development project in your area?
(4) If Yes, in what development project and How?
(5) Did you witness any improvement in educational projects through Information and Communication technologies?
(6) What have you learnt through educational programmes facilitated by Information and Communication technologies e.g. social media/ internet
(7) How did the Information and Communication Technologies improve your well-being?
(8) To what extent did Information and Communication Technologies bring about improvement in infrastructural development in your area?
(9) Can you mention any infrastructural development that was necessitated by Information and Communication Technologies in your area e.g. computers?
(10) What is your perspective on what should be done in order to utilize Information and Communication technologies in your area?
(11) Are Information and Communication technologies relevant for development?
(12) If No what do you think should be done in order to make them relevant?

QUESTIONNAIRE

SECTION A: BACKGROUND INFORMATION

OCCUPATION

Student	1
Farmer	2
Entrepreneur	3
Teacher	4
Other	5

GENDER

Male	1
Female	2

AGE	**S/N**	**Mark**
18-25	1	
26-35	2	
36-45	3	

EDUCATION	**S/N**	**Mark**
High school	1	
Diploma	2	
Degree	3	
Other	4	

Language Spoken

English	
Xhosa	

SECTION B: AVAILABILITY AND ACCESS OF ICTS

B1.1) Access

Using a tick in the appropriate box, respond to the following questions/statements

B1.1a) Do you have access to ICTs in your community?	Yes	
	No	

B1.1b) If Yes to question **B1.1a,** Do you have access to a		S/L	Mark
	Computer?	1	
	Phones?	2	
	Radio?	3	
	Television?	4	
	Scanners?	5	
	Printers?	6	
	Slide Projectors?	7	
	Photocopiers?	8	
	Fax?	9	

B1.1c) Do you have access to the internet	Yes	
	No	

B1.1d) If yes to answer **B1.1c** Which ICT do you use to access the internet?		S/L	Mark
	Computer	1	
	Phones	2	

B1.1e) Where do you access the internet		S/L	Mark
	home	1	
	work	2	
	school	3	

B.1f) What do you use these ICTs for?		S/L	Mark
	Accessing the web	1	
	emailing	2	
	calling	3	
	typing	4	
	photocopying	5	
	Scanning	6	
	printing	7	
	faxing	8	

B2.1a) Do you have access to government communication programmes on educational and infrastructural development?

Yes	
No	

B2.1b) If Yes, How do you inform yourself with government communication on educational and infrastructural programmes?

1	2	3
internet	radio	television

B2.1c) Does the Nkonkobe local municipality support educational and infrastructural development through ICTs?

Yes	No	Not sure

B2.1d) If Yes Please Explain?

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SECTION C: BENEFITS OF ICTs

C1.1a) in what way have you benefited from these Information and Communication Technologies?

1	2	3	4	5
Social communication	News reading	Academic information	Employment opportunities	Business communication

C1.1b) how did these Information and Communication Technologies help in developing your area?

1	2	3	4	5
Promoting educational programmes	Connecting the community to the world	Facilitating the access for infrastructural equipment	Helping in informing the youth on job opportunities	Promoting health awareness programmes

(**C1.1c)** to what extent do you think Information and Communication Technologies facilitate development in your area?

Lesser	Less	Great	Greater	Not sure

C2.1a) Do you receive information concerning educational activities?

Yes	
No	

C2.1b) If Yes, please state the ICT that support educational or infrastructural activities?

Radio	1	
Television	2	
Internet	3	

C2.1c State the educational or infrastructural activities supported by these Information and Communication technologies mentioned on question **C2.1b**?

Activities	**Yes**	**No**
HIV/AIDS shows		
Academic Course lecture		
Social community discussions		
Infrastructural development support programmes		

C2.1c) If yes, are you satisfied with the programme?

Yes	

No	

C2.1d) Explain

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SECTION D: CONSTRAINTS

D.1a) which of these are the main constraints in accessing Information and Communication Technologies for educational and infrastructural purposes?

Lack of access	1	
Lack of utilisation	2	
Lack of resources	3	
Lack of education	4	
Other	5	

D.1b) what should be done to increase full utilisation of Information and Communication Technologies?

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University of Fort Hare
Together in Excellence

ETHICAL CLEARANCE CERTIFICATE
REC-270710-028-RA Level 01

Certificate Reference Number:	OSU231SNGC01
Project title:	**The role of Information and Communication Technologies in the implementation of educational and infrastructural development projects: Evidence from Alice, Middledrift and Fort Beaufort, East Cape**
Nature of Project:	Masters
Principal Researcher: Sub-Investigator:	Thandisizwe Thando Ngcume
Supervisor: Co-supervisor:	Dr OO Osunkulne

On behalf of the University of Fort Hare's Research Ethics Committee (UREC) I hereby give ethical approval in respect of the undertakings contained in the above-mentioned project and research instrument(s). Should any other instruments be used, these require separate authorization. The Researcher may therefore commence with the research as from the date of this certificate, using the reference number indicated above.

Please note that the UREC must be informed immediately of

- Any material change in the conditions or undertakings mentioned in the document
- Any material breaches of ethical undertakings or events that impact upon the ethical conduct of the research

The Principal Researcher must report to the UREC in the prescribed format, where applicable, annually, and at the end of the project, in respect of ethical compliance.

Special conditions: Research that includes children as per the official regulations of the act must take the following into account:

Note: The UREC is aware of the provisions of s71 of the National Health Act 61 of 2003 and that matters pertaining to obtaining the Minister's consent are under discussion and remain unresolved. Nonetheless, as was decided at a meeting between the National Health Research Ethics Committee and stakeholders on 6 June 2013, university ethics committees may continue to grant ethical clearance for research involving children without the Minister's consent, provided that the prescripts of the previous rules have been met. This certificate is granted in terms of this agreement.

The UREC retains the right to

- Withdraw or amend this Ethical Clearance Certificate if
    - Any unethical principal or practices are revealed or suspected
    - Relevant information has been withheld or misrepresented
    - Regulatory changes of whatsoever nature so require
    - The conditions contained in the Certificate have not been adhered to

- Request access to any information or data at any time during the course or after completion of the project.

- In addition to the need to comply with the highest level of ethical conduct principle investigators must report back annually as an evaluation and monitoring mechanism on the progress being made by the research. Such a report must be sent to the Dean of Research's office

The Ethics Committee wished you well in your research.

Yours sincerely

Professor Gideon de Wet
Dean of Research

01 October 2015