



**Harnessing ICT's Capacity Building for Marginalized  
Communities of Vhembe District Municipality in Limpopo  
Province, South Africa**

**By**

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A Dissertation Submitted to the Department of Information Systems  
in the School of Management Sciences in Fulfilment of the  
Requirements of Master Degree of Commerce

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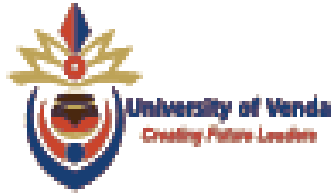
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## Declaration and approval

I, Nemalamangwa Mulanga Aluwani Wisdom (11633909) hereby declare that this dissertation entitled “Harnessing ICT’S Capacity Building for Marginalised Communities of Vhembe District Municipality in Limpopo Province, South Africa.” is my own original work and is prepared in fulfilment of the requirements of the degree of Master of Commerce in Business and Information Systems at the University of Venda. No part of this dissertation has been presented nor submitted for another degree or diploma at this institution or any other university. All chapters of this dissertation may contain information from various material sources used in this study is fully cited, acknowledged, and referenced, including all the secondary literature that is used to show that this material has been used to support my research.

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Date \_\_\_10 April 2024\_\_\_

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## APPROVAL

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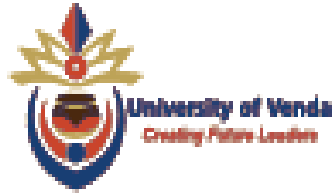


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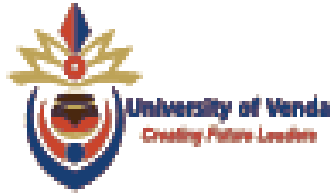
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## **Dedication**

I dedicate this study to God Almighty my creator, my source of inspiration, wisdom, knowledge and understanding. He has been the source of my strength, will and courage to pursue the goal to write this research dissertation with pure intent. I also dedicate this work to my late father, Nemalamangwa Fhambanani Adler and my mother, Ravhudzulo Shonisani Eunice who raised me to become the person I am today and whose encouraging guidance made sure that I give it all what it takes to finish that which I have started and believed in the value of education. Also, to my special family who have been affected in every possible way by this research journey. Thank you. My love for you all can never be measured. God bless you.



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It would be inappropriate if I omit to mention the names of my dear friends, Netshirando V and Ramagoma R, who have kept me on my path to success in their own way, helping me in whatever way they can, and ensuring that good times continue to flow.

This research and the relationships that I was privileged to develop during this study have enriched my life and spirit massively and made me aspire to improve myself to become a better professional researcher. I will always be grateful to have explored the importance of ICT building capacity for the disadvantaged groups of people for such an opportunity.



## **Abstract**

Information Communication Technology (ICT) brings hope to marginalised people who are excluded from participating in the mainstream activities in South Africa, such as groups of people living in communities within the Vhembe district Municipality. This study investigated the factors affecting marginalized people from using ICT services for development and went on to propose a sustainable information and communication technology (ICT) framework. This study gathered reliable empirical data to gain a deeper understanding of the impacts of ICTs capacity for development in marginalised groups in South Africa. This was done by reviewing ICT policies and ICT regulation making process. A literature review was conducted to enhance the understanding of human capabilities through ICTs. The review examined many articles to identify the different theories of development and the role of technologies in the process of development. This study adopted a positivism research paradigm associated with quantitative research for hypothesis testing. This study is intended to propose a framework to facilitate the development of ICT capacity among the marginalized people. This study is underpinned by Amartya Sen's Capability Approach and theories that operationalise it, to evaluate the impact of ICTs towards human capabilities. The framework provides a multidimensional perspective to understand capacity building of marginalised communities and how ICTs can be a catalyst empowerment. The study will contribute to the ongoing debate on the impact of ICT provision and usage in marginalized people for capacity building (CB).

**Keywords:** Capability Approach (CA), ICT Capacity building (CB), Information and Communication Technology (ICT) and Policy.



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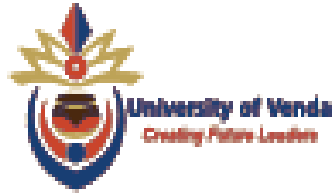
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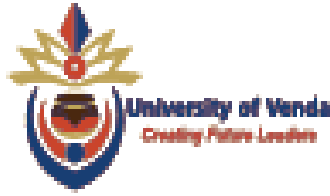
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**Table 1: List of acronyms**

AEF	Alternative Evaluation Framework
AGM	Annual General Meeting
CA	Capability Approach
CB	Capacity Building
CF	Choice framework
CHC	Central Human Capabilities
IBA	Independent Broadcasting Authority
ICASA	Independent Communication Authority of South Africa
ICT	Information Communication Technology
ICTCB	ICT Capacity Building
IRA	Independent Regulatory Agency
IS	Information System
IT	Information Technology
LDCs	Least Developing Countries
REC	Regional Economic Communities
RR	Regional Regulatory
RRA	Regional Regulatory Affairs
SABA	Southern African Broadcasting Association
SADC	Southern African Development Community
SADCC	Southern African Development Coordination Conference
SATRA	Southern African Telecommunications Regulation Authority
SPSS	Statistical Package for the Social Sciences



TRASA	Telecommunications Regulatory Authority of Southern Africa
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## **CHAPTER 1: INTRODUCTION AND BACKGROUND OF THE STUDY**

### **1.1. Introduction**

The digital world is advancing at a fast pace that few citizens can cope with the technological changes, resulting in the digital disadvantaged citizens at risk of being left behind in technology due to lack of access to information and communication (ICT) and the inability to effectively utilize digital technology (Naicker, Turpin & van Belle, 2020). According to Baydas and Goktas (2017), ICT capacity building is a keystone that must be included in different ICT policies to inform stakeholders. For some authors, even if there are significant ICT policies, the integration of ICT in disadvantaged groups is still a complex process (Kabui et al., 2018). As a key resource, ICT capacity must be regularly updated to meet the changing demands of people. The study by Marshal and Taylor (2016), argues that the potential of ICT to assist communities to increase their overall well-being through community development is relatively few compared to commercial applications. Khader and Kosko (2019) describe capability approach as theoretical lens that allow people to develop based on their ability to live the lives they value. The quality of life of an individual pertains to functions or states of life, such as good health, and the capacity of an individual as a set of desirable conditions (Du Bois & Chigona, 2018). People with access to ICT and the ability to effectively use it, increases both their awareness of the opportunities available and their ability to take advantage of opportunities, such as online open access (Uys & Pather, 2016). The focus of this study was to investigate initiatives undertaken by the South African government and non-governmental organizations to assist marginalized communities to adopt and use ICTs by proposing a sustainable ICT framework in South Africa.



## **1.2. Background of the study**

Despite the promise of technological freedom, inequities in access are evidenced worldwide (Samoilenko and Osei-Bryson, 2018). In the study conducted by Ahrens, (2018), it was established that there is a huge gap in citizens' ability to efficiently access the ICTs services to improve their livelihoods. Human capacity development in ICT skills is a common goal in South Africa, written in the Constitution with the goal to improve the quality of life through the release of the potential of each individual citizen. The success of ICT projects in disadvantaged groups depends on sustainability and the deployment of suitable infrastructure (Negumbo, 2018). In other words, an ICT related project should consider local needs and local skilled staff or the provision of adequate training to develop local people. If such projects still depend on foreign staff and skills, then it is not a case of the transfer of technology but of the dumping of technology that is often outdated and with little value to the intended users (Tondeur et al., 2017). Involving local people in ICT development projects helps enhance their ICT skills and the promotion ICT usage by disadvantaged people.



### **1.3. Problem statement**

For development projects, numerous information and communication technologies have made no difference, and some have even caused harm in their communities (Coetzee, 2019). In this era of global integration, marginalized people in South Africa are constrained and find it hard to access ICTs for enhancing their livelihoods (Abdul Raheem et al., 2018). Information Systems (IS) study has attempted to resolve issues related to regional ICT policy and regulation making in marginalised communities, but there is still a scarcity of studies on the topic (Makoza, 2019). Part of the reason is lack of research that focuses on strategic issues on ICT and capacity building (Qureshi, 2017).

The task of providing access to ICTs is subject to special challenges confronting disadvantaged areas in developing countries. According to Guler and Demir (2020), challenges include remoteness, which leads to high start-up and maintenance costs and a lack of power, so in rural areas computers often require voltage stabilizers and generators. The absence of relevant human resources (especially maintenance and repair technicians). The cost of the equipment used must therefore be affordable. The low-earning capacity of the rural population could lead to companies charging prices that, at the highest possible level, could only be affordable by the small minority. The study looks at the development of ICT in disadvantaged communities to gain deeper knowledge of factors limiting citizens from using ICT.

### **1.4. Aim of the study**

The aim of this study is to find factors affecting marginalized people from using ICT services for development in Vhembe district of Limpopo province in South Africa.



### **1.5. Research questions**

1. What does ICT entail in marginalized people for capacity building and how can ICTs be integrated with local development plans?
2. What factors affect marginalized people from adopting ICTs and what is the government doing to assist?
3. What are the existing regional ICT policies and regulatory bodies on ICTs for the marginalized communities?
4. How are existing regional ICT policies and regulatory bodies ICTs used to empower the disadvantaged people in South Africa?

### **1.6. Justification/ significance of the study**

The rationale of the study was to bring a clear understanding of how ICT can be adopted and used for development purposes by reviewing ICT policies, regulations and citizens of South Africa whom ICT policies are imposed to. The study helps to understand how ICTs can be used at the regional level. This research contributes to ICT's broader discipline for deepening an understanding on how technological innovations could enhance the capabilities of the disadvantaged people for improving their quality of lives. Furthermore, the study adds new insights for policy makers on the best ways to harness ICTs in marginalized people. Finally, the study will add new knowledge to the board of existing literature by proposing framework for promoting capacity building of marginalized communities in ICT skills.

### **1.7. Research scope**

This study was conducted in Makhado and Thulamela local municipalities under Vhembe District municipality, Limpopo province, South Africa. Vhembe District Municipality is highly characterised by rural communities with marginalized people living in them. The targeted populations were all disadvantaged residents such as people living with disability (the challenged people), females and the poor with the ability to read and have at least a basic understanding of information technology in these designated municipalities. Information Communication Technology services were mostly used in urban areas but recently marginalised people living in rural areas such as communities in Vhembe district are gradually adopting and using ICT services for their personal development.



### **1.8. Delimitation of the study**

The study was conducted during unfavourable time wherein there was a wide spread of Covid-19 virus, which made it difficult to gather information. The time constraints have affected the size of the sample selected. The nature of the study required the researcher to assess the participants' responses and perceptions at a specific time. There were respondents who were not willing to participate in the study since it was voluntary. Some respondents were deceitful in answering the survey questionnaires which may lead to biasness, over-reporting, and under-reporting to the study. Various costs were involved in completing the research such as communication, transportation, and costs of obtaining relevant literature situates the researcher to use data and information easily available only, and therefore data collected in some cases may be biased. The study focuses only on ICT capacity building within the context of the marginalized people in Vhembe district municipality in Limpopo province, South Africa. This study is confined in Vhembe district municipality in Limpopo province, South Africa.

### **1.9. Outline of the research project**

This research project is composed of five chapters explained below:

#### **Chapter 1: Introduction**

This chapter provides a brief to this study, including the background to the study, problem statement, aims and objectives, research questions structure of the study.

#### **Chapter 2: Literature Review**

This chapter comprises of a review on existing knowledge in this area of study from a variety of sources which are directed by the objectives of this study.

#### **Chapter 3: Research Methodology**

This chapter outlines the research design and methodology in detail. It uses the objectives of the study to determine the research methodology, the data collection procedures, the tools and techniques for data collection and the analysis of data.

#### **Chapter 4: Presentation of research findings**

This chapter discusses and presents the analysis and results of the data collected using appropriate research instruments.

#### **Chapter 5: Summary, conclusions, and recommendations.**



This chapter presents the findings, conclusions, future recommendations, and a framework for the implementation of ICT CB in marginalised communities of South Africa.

## **CHAPTER 2: LITERATURE REVIEW**

### **2.1 Introduction**

This chapter examines and reviews the existing literature on ICT capacity building using different sources of the information, including research papers, articles, and books. Information system research has sought to address the challenges with regional ICT policy, currently there is a shortage of research on ICT capacity building (Makoza, 2019). Part of the cause is a shortage of study on strategies to address ICT challenges and capacity building (Qureshi et al., 2020). Policy concerns become a subject of concern in marginalized people (Makoza, 2022). This study will be supplemented with literature from other domains, such as regional ICT policy studies and ICT control studies in South Africa's underprivileged populations, to address these ICT difficulties. The literature review is characterized as a synthesis of secondary literature pertaining to the dissertation's research subject (Litvin, 2019). The following is the order in which the chapter is discussed, ICT in the context of local capacity building, benefits of building capacity to ICT, reasons for ICT capacity building failure, challenges of successfully harnessing ICT in marginalised groups of people, the integration of ICT with local development plans, factors affecting marginalized groups from adopting to ICT, regional ICT regulation in the Southern African Development Community (SADC), challenges of regional



ICT policy, regional competitiveness, theoretical Framework of the study, conceptual Framework for the Study.

## **2.2 Operational definitions**

### **i. Capability Approach (CA)**

The Capability Approach provides a comprehensive framework for assessing the well-being of individuals and social arrangements, developing policies, and proposing social change in society (Culp, 2019). CA's primary elements are functions which are beings and doings and capabilities. Functions are related to happiness, but capabilities are related to the possibilities and freedom to carry out such functions (Bernardi, 2019).

### **ii. Capacity Building (CB)**

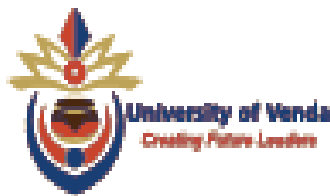
Capacity building is defined as an extensive socioeconomic opportunity for growth in which there are rapidly changing competitive dynamics in organizations and marketplaces that might result in an expanding capacity that is complex to develop (Shams and Hasan, 2020). CB is also described as the process through which individuals and organizations acquire, enhance, and maintain the skills, knowledge, tools, equipment, and other resources necessary to perform their work successfully (Konidena and Timblo, 2020).

### **iii. Information and Communication Technology (ICT)**

ICT is described as a set of technologies and applications that enable the electronic processing, storage, and transfer of data to a diverse group of users (Malanga & Banda, 2021). ICT is a set of human and non-human objects, processes, and behaviours that try to modify or change natural or social phenomena to fulfil human aims (Galliers, 2021). The two definitions emphasize the significance of explaining ICT, with the first focused on technology. The second definition considers a range of perspectives on ICTs that go beyond technology and include social or human elements.

### **iv. Policy**

Policy is described as a system of regulations or guidelines that direct actions by assigning value to ideals, as a process-based activity and discursive practice (Syssner, 2020). Policy is defined by the aims and objectives that are linked with other development agendas, as well as the activities and practices of stakeholders (Datta et al., 2019). Policy also expresses the



principles and ideals of the sector in connection to social and historical settings, as well as the continuity of facts across time (Pillay, 2018).

## **2.3. ICT Capacity building**

### **2.3.1. ICT in the context of local capacity building**

Capacity building is an important element of every ICT development project. ICT user's capacity must be enhanced through training and provision of ICT infrastructure to improve the usage (Fouche et al., 2022). Developing local user's capabilities and utilizing local institutions such as schools and community halls to empower residents to participate in ICT initiatives and ensuring that the developments are used by the local community (Thapa & Omland, 2018). Capacity building includes ICT training and the promotion of fundamental ICT skills (Pather & Uys, 2020). These training activities are critical for establishing a competent network of team members with the necessary knowledge and abilities to manage the ICT infrastructure (Coetzee, 2019).

### **2.3.2. Benefits of building capacity to ICT**

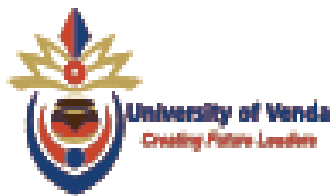
Chipidza and Leidner (2019) outline three main areas for using ICT potential for poverty reduction which are, opportunity, empowerment, and security. Opportunity helps markets operate better for the disadvantaged and increases their assets. Empowerment improves the functioning of government institutions for the disadvantaged and removes social obstacles. Security aids impoverished individuals with risk management. Crompton et al. (2021) suggest that the low cost and widespread of ICT infrastructures including the Internet, radio, and television, education can now be delivered to remote rural areas, and information technology training is now being given in rural schools and commercial institutes. Robinson et al. (2020) state that ICT can also enhance the delivery of health care to the poor. The impoverished gain empowerment because they believe they are receiving a service rather than a favour (Katunga, 2019).

### **2.3.3. Reasons for ICT capacity building failure**

Smith (2022) suggests that developing ICTs for sustainable development requires a transformation in vision and application. Many ICT programmes have failed to achieve their planned aims and purposes, but have rather caused implications (Coetzee, 2019). Funders may overlook some of the benefits unanticipated to be considered throughout the planning and



design process (Mthoko and Khene, 2018). One of the major problems in the design and implementation of ICT is the failure to incorporate the rural and social setting (Fouche, 2022). Most ICT projects require unique solutions that are suitable for the setting in which they are implemented. Western norms and ideas cannot just be transplanted to rural situations, these ICT initiatives must consider the larger social and economic context (Ramirez & Wedlake, 2022). It is argued by Yim and Gomez (2022) that the lack of community involvement in design, implementation, and assessment of an ICT project may result in the failure of that project. It is frequently claimed that independent ICT system designers and evaluators can effectively develop, execute, and evaluate ICT initiatives in communities other than their own. This disregards the target audience's viewpoints, resulting in the community getting interpretations from stakeholders who are far away from their context. According to Krauss et al. (2019), the promise of ICTs to accelerate social development can never be realized unless programs are driven and launched by community members themselves and goals become political and risk becoming subjective (Coetzee, 2019). This implies that ICT projects are frequently delayed by political and subjective perspectives. Where there is political unrest, such programs are also difficult to implement and assess. When merely using their expertise, ICT experts can be subjective, and they may miss more appropriate techniques for the design, implementation, and assessment of ICT if they do not enable open and participatory practices, and inadequate funds and resources (Pather & Uys, 2020). Due to limited community resources, funding is a barrier in many ICT initiatives, particularly for marginalized people. The expertise, time, and effort necessary for these undertakings are not free. Because the advantages of these programmes are not immediate and frequently long-term, and bring minimal political gain, obtaining continued financing is tough considering the time-sensitive nature of ICT programs (Ayoung, & Abbott, 2021). Based on this statement, the ICT advancements are associated with human infrastructure. The initiatives are reviewed too quickly because assessors do not consider the long-term advantages and that the project may be abandoned during the pilot phase because they do not allow benefits to emerge as time passes (Young, 2021) not considering all stakeholders (Aljarallah & Lock, 2020). This implies that many actors are involved in ICT projects, and each interest must be addressed. Usually, too much emphasis is placed on the interests of external stakeholders, such as funders and project managers, while too little emphasis is placed on internal stakeholders, such as



individuals in the community or the community. Both might be troublesome for the project's long-term viability and unrealistically ambitious goals (Coetzee, 2019). Budgets for such initiatives are frequently characterized by unrealistic goals. The capacity of these funds to meet the objectives is just insufficient, and hence the project may fail if unsatisfied stakeholders are unable to recognize the objectives being fulfilled.

#### **2.3.4. Challenges of successfully harnessing ICT in marginalised groups**

The challenges that arise during the requirement and design stages of ICT development projects are sometimes the result of a failure to assure sufficient background, engagement, and process iteration for the effective implementation of these ICTs (Fouche et al., 2022). According to Okonkwo et al. (2022), these methods are required for gaining an in-depth understanding of the context of the communities in which ICT are implemented, as well as for increasing awareness and acceptance of ICT. The difficulty in getting this knowledge and raising awareness and acceptability comes from high illiteracy rates and other unstable societal elements that are common in developing countries (Fouche et al., 2022). Access to information regarding community components such as local people, government structures, groups, communication, legal restraints, and supporting organizations, as well as understanding of IS in rural areas, is restricted (Aljarallah & Lock, 2020). Okonkwo et al. (2022) argue that, for any system to be effective, the social and technological pillars of development must interact. All of this necessitates additional time for system developers to identify appropriate stakeholders for the system and to create a shared understanding of the system among community members (Lynn, 2022).

#### **2.4 The integration of ICT with local development plans**

According to Smahel et al. (2022), ICT acts as a catalyst for effective development, but it must be used in integration with the appropriate developmental methods. Yusri. (2022) suggests that a development project for a developing country usually focuses on different issues, including poverty alleviation, education, human skill development, and the building of a social environment conducive to the supply of universal access to basic welfare services. Zavratnik et al. (2020) argue that in marginalized communities, ICT projects must address these problems while also harmonizing with the country's development plans. Most studies on the role of regions in regional ICT policymaking have revealed a considerable number of areas affected



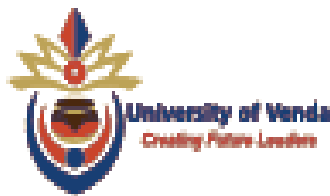
by exclusions in modern countries (Zapata-Barrero & Cantle, 2018). According to Langan (2020), the observed tendency of growing regional policymaking necessitates the creation of insights outside of the strongly connected areas. Four approaches on ICT adoption and implementation were considered to investigate the integration of ICT with developmental goals: the digital divide, technology diffusion and innovation, ICT and Development, and ICT and organizational change.

### **2.4.1 Digital divide**

The terms ICTS and digital divide are described to unequal access to and distribution of information and communication (Lythreatis et al., 2021). Digital divide is described as the difference in the extent to which affluent and poor countries benefit from various types of information technology (Schejter, 2021). Lack of technology and infrastructure (Inegbedion, 2021), limited access to digital resources, and a lack of network connection all contribute to the digital divide (Nyika, 2020). The digital divide has had an impact on people's way of living (Satar, 2019). Most African nations are impoverished and lack knowledge, restricting their ability to access the internet (Aruleba & Jere, 2022). According to studies, ICTs adoption in rural areas is delayed owing to a lack of ICTS infrastructure, poor or no income, health difficulties, cultural differences, and a few other variables (Lai & Widmar, 2021). According to studies, rural populations in developing countries have restricted access to power (Nyika, 2020).

#### **2.4.1.1. Challenges faced by digital divide in rural areas**

According to Dawood (2019), obtaining the potential advantages of the Internet requires that the issue of inexpensive and low-cost access in rural areas and other low-income populations be overcome. According to Mojapelo (2020), the situation is certainly more complicated, with several technological and societal problems to address. Resolving the conflict between technological advance and local development demands is one of the most common issues. In certain rural areas, there is a dearth of electricity (Mojapelo, 2020). In the remote location where an intervention is taking place, there is a dearth of supporting communication infrastructure, the local rural community's lack of computer-related abilities, the rural area concerned has a scarcity of PC-related applications and long-term job options, technical personnel are in short supply, difficult topographical features, such as lakes, rivers, hills, mountains, or deserts, make

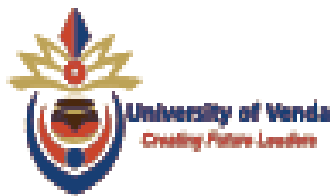


wire communications network building prohibitively expensive (Mojapelo,2020). Severe weather conditions place severe demands on the equipment, agriculture, fishing, and handicrafts account for most economic activities. Income per capita is low, social infrastructure is underdeveloped, population density is low, there is no ICT policy, bureaucracy is described as an issue when it comes to ICT, donor coordination is lacking, delays in implementation lead to a loss of interest, lack of knowledge and grasp of ICTs, technology advancement. Inadequate local manufacturing capability, spare components are scarce, rapid technical advancements and high hardware and software costs.

#### **2.4.1.2. Bridging digital divide in South Africa**

According to Singh (2021), to bridge the digital divide, policy prescriptions must first have a clear understanding of the fundamental reasons of the digital divide. That is, the effectiveness of any policy prescription to close the digital divide will be substantially determined by how successfully that policy prescription addresses the underlying causes of the digital divide. South Africa, with its apartheid background, has an unparalleled dedication to changing its legacy of racial inequities in freedom, access to knowledge, wealth, and opportunity. The country is focused on overcoming and mitigating the disadvantages in vast sectors of society caused by previous policies (Lewis, 2020). According to Mogale (2021), ICT centers were developed in several parts of South Africa to address the problem of digital divide. According to Goggin et al. (2018), the major thought underlying ICT centres in South Africa emanated from ANC-aligned organisations in the early 1990s to empower underprivileged populations. According to Lewis (2020), the Universal Service Agency (USA) is a one-of-a-kind legislative entity formed by the South African Telecommunications Act, 1996. USA intended to provide cheap universal access and universal services in ICTs for underprivileged communities in South Africa to assist development, empowerment, and economic progress. These ICT centers, which are in underprivileged communities, mainly rural areas, are managed and operated by approved operators.

According to Lewis (2020), the following are some of the significant initiatives identified and used to generate appreciation for the use of ICT in the Vhembe district municipality in South Africa: 1. Muvex ICT (Pty) Ltd, which strives to simplify teaching using mobile technology. 2. ICT Lulaway Pilot Project gives jobless adolescents access to technology and information to help them find work. Furthermore, ICT skills are critical in assisting kids in creating more

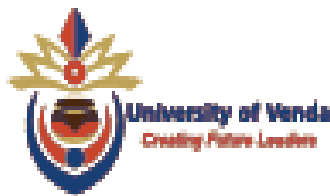


prospects for themselves in terms of business. 3. Since the commencement of the E-Agriculture initiative in October of last year, 215 farmers and 16 extension officials have been taught in fundamental ICT skills utilizing Digital Doorways, which are powerful computer stations with several displays that enable Internet connectivity to remote areas. This guarantees that farmers have access to services via the Internet, bulk SMS messaging on cellphones, and other ways. Our extension officers, for example, should be able to SMS farmers and urge them not to irrigate today because it will rain tomorrow. 4. Mazuwo Wireless, which is situated in the municipality of Vhembe and focuses on connecting households and businesses to the internet. 5. Vexospark, which provides computer and business training to rural Limpopo residents.

## **2.4.2. Diffusion of technology and technology innovation**

### **2.4.2.1 Technology diffusion in marginalized groups**

Hossain (2020) describes technology diffusion as the process by which an innovation is shared over time among members of a social system through specific channels. Diffusion is described as a dynamic and time-dependent process that involves the exchange of information, knowledge, and inventions (Antonelli & Tubiana, 2020). It represents the continuous and slow spreading of new ideas and concepts throughout large-scale and diverse communities (Lechman & Marszk, 2019). Technology diffusion is expected to be faster for simpler technologies where software knowledge is easily learned and transmitted, for densely packed populations where mixing is easy, where early users spread the word passionately, and in situations where the new technology is clearly superior to the old one and no major switching costs arise when switching from one to the other (Falck, 2021). The socioeconomic viewpoint, the diffusion of innovations, new technologies, and new ideas, among other things, are essential because they cause substantial changes in society and economy, influencing shifts in productivity and education, and reshaping markets and organizations (Houngbonon & Quentrec, 2019). Technology diffusion emphasizes the unique importance of two-step communication in diffusion processes, which allows for the flow of knowledge about the benefits of new technology between users and non-users (Jayaprakash & Pillai, 2018). Positive effects of technical innovation may differ considerably among locations because technological advancement can only yield economic rewards if it is embraced and absorbed by civilizations (Masiero, 2022). According to Kallal et al. (2021), the adoption of new technologies and their contribution to growth and development is far from automatic, and the pervasiveness and



acceptance of new technology, as well as the rate at which technology diffuses, are attributed to complex social, institutional, and economic forces.

#### **2.4.2.2 Technology innovation**

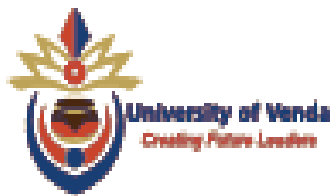
Chatterjee (2021) asserts that the development of long-term advantages from widespread technology adoption is preconditioned by societies' absorptive capacity as well as their ability to deploy and utilise technology. The ability of societies to rapidly accept breakthrough technology is largely determined by the institutional environment, societal attitudes, norms, and values, as well as a variety of economic or institutional incentives (Coccia, (2018). According to Lechman et al. (2020), civilizations integrate new technology by depending on their intellectual capital, which includes institutional and cultural conditions. Better educated civilizations, on the other hand, with less risk aversion and a strong proclivity to absorb innovations, assimilate new technology relatively easily and swiftly (Guzman, 2022). To put it another way, the rate of spread and innovation is determined by various civilizations' absorptive capacity.

#### **2.4.3. ICT and Development**

ICT and development are a broad concept that may be divided into two parts: the basic notion of development and the interaction of ICT with it. The literature on ICT and development is firmly divided into two camps, depending on optimistic and pessimistic perspectives (Gurung, 2018). According to the positive viewpoint, ICT may operate as a catalyst for growth by making information interchanges faster and more frequent, as well as by lowering costs (McNamara & Sepasgozar, 2020). Telecentres and information kiosks in developing nations provide impoverished people with access to information about their governments, market pricing, health, and education (Vemula, 2020). The pessimistic viewpoint holds little optimism that ICT will contribute to national development in poor nations (Glyptis et al., 2020). Researchers in this style believe that ICT will not benefit marginalized areas growth due to underlying issues such as poverty, inadequate communications infrastructure, and a lack of IT investment.

#### **2.4.4 Regional economic communities integrated with policy harmonization**

Regionalism is described as both a discipline of international relations (IR) that examines world regions and the mechanism by which regions change the globe (Costa et al., 2019). Economic



integration is pursued by regional economic communities through policy harmonization, which may be viewed as both a process and an end (Daniels et al., 2019). Borzel and Risse (2019) argue that harmonization has been difficult to achieve and that an overemphasis on harmonization as an objective may hinder adaptability. The highly dynamic ICT industry demands adaptive policymaking to adapt to changing market conditions and anticipate technical development which is quickly emerging in a variety of disciplines (Kauffman, 1995). Over the last three decades, regional economic communities (RECs) such as the Southern African Development Community (SADC) have grown significantly (Kunyenje, 2019). While not all regional communities have thrived the adaptive policymaking, the adaptive policy making is described as a process that adapts to changing conditions or predicts change and is resistant to it.

#### **2.4.5. ICT and organizational change**

According to Badruddozza and Ramage (2018), technology adoption within a changing corporate environment leads to core concepts of organizational transformation. These scholars aim to comprehend IS by investigating the combination of technological and social factors about any theories that have been created to study the internal or external elements influencing organizational change, as well as how people actively manage it (Takavarasha, 2018). The emergent model emphasizes that change is an open-ended and ongoing process of adaptation to changing situations and circumstances, rather than being directed from the top down (Rath et al., 2022). This implies that the importance of organizational context in ICT-led organizational change research has grown, and the potential value of ICT and IS may be realized within an autonomous setting surrounded by social actors. NGOs and local community organizations are important sources when implementing ICT interventions in developing countries, practitioners and researchers should investigate the potential impact of ICT interventions at the organizational level: the importance of context in ICT-led community projects cannot be overstated.

##### **2.4.5.1 Factors influencing ICT adoption at firm and individual level**

From the literature review studies, several factors have been identified which have an influence on the business performance at firm level which describes the strategies implemented and user's perception at individual level towards ICT adoption.



### **2.4.5.1. Factors Influencing ICT Adoption at Firm Level**

#### **a. Relative Advantage**

Relative advantage is defined as the extent to which an invention is judged to be superior to the concept it replaces (Arslan, 2019). Much prior research has found that relative advantage is a key predictor of ICT adoption and usage rates, and good management control is required to get a competitive edge in company (Taylor, 2019). Jaganathan et al. (2018) argue that the use of ICT provides the firm with a competitive edge adoption of ICT to improve corporate performance, efficiency, and management control. The adoption of ICT is determined by entrepreneur's favourable perceptions of relative advantage.

#### **b. Compatibility**

The degree to which an innovation is viewed as being compatible with the current values, prior experiences, and requirements of potential adopters is characterized as compatibility (Taylor, 2019). Several prior research have found that compatibility between the new and old systems is a strong predictor of innovation uptake (Arslan, 2019). According to Cozzarin (2022), company owner-managers are more inclined to accept new ICT when they believe it is suitable with their present condition of business.

#### **c. Complexity**

According to Jaganathan et al. (2018), complexity is the degree to which an invention is seen as being particularly difficult to grasp and use. The term complexity relates to how hard and tough the system is to understand and apply in the company (Arslan, 2019). The degree to which the new information system differs from the previous information system was defined as complexity (Cozzarin, 2022). Some scholars have shown that the complexity of information systems is negatively connected to their adoption and utilization (Chen & Zhang, 2019). If consumers believe the information system to be overly complicated, the new information system is likely to be rejected.

#### **d. Perceived Social Influence**

The social status achieved in one's reference group because of employing information and communication technology is referred to as social influence (Cozzarin, 2022). Based on non-benefits or no-profitability justifications for innovation adoption, social influence is one of the primary determinants of innovation (Nemeth, 2019). It is possible to use ICT in



underdeveloped nations simply because society regards organizations that utilize ICT in their operations to be of high social standing. Chen and Zhang (2019) argue that a multi-personal information system, such as e-mail, is more impacted by social values than a stand-alone computer program such as Microsoft Word.

#### **e. Organization's location**

Jaganathan et al. (2018) define organizational location as the firm's physical position in relation to critical supporting ICT infrastructure and services. Rural businesses have limited access to ICT suppliers, internet service providers (ISPs), ICT professionals, and institutions that offer ICT assistance and training courses. Cozzarin (2022) also indicates that the country's geographical variety adds greatly to the varying growth of ICT adoption throughout the country.

#### **f. Organization's Size**

The size of the company has a considerable impact on the likelihood of ICT adoption (Cozzarin, 2022). Adoption of some ICT technologies involve a significant expenditure of resources (Chen & Zhang, 2019). Due to a lack of resources, small enterprises may be less likely to adopt costly ICTs; thus, large firms might be predicted to be more disposed to ICTs (Nemeth, 2019). Theoretical views that the size of the firm is an essential organizational aspect can impact the application of information and communication technologies (Cozzarin, 2022).

#### **g. Top Management Support**

The management's assessment of the advantages of ICT adoption emerges as a critical input to the effective adoption and use of ICT for business (Chen & Zhang, 2019). According to Jaganathan et al. (2018), senior management support can increase ICT adoption. If senior management has a positive attitude toward ICT adoption and usage, there is a good chance that the required resources will be allocated for ICT adoption and usage. Through good communication with employees, senior management may also lead an ICT adoption and usage process.

#### **h. Competitive Pressure**

Market competition is rapidly becoming a motivator for ICT adoption and use. According to Jaganathan et al. (2018), the introduction of technological innovation has generated a new form



of commercial competitiveness. As a result, the level of market rivalry is one of the motivators for SMEs in both developed and developing nations to adopt and use ICT (Nemeth, 2019). Previous research has also found that competitive pressure impacts organizations' adoption and usage of ICT as part of their strategy (Chen & Zhang, 2019). Firms compete on how to reach clients quicker and provide higher-quality services than their competitors.

### **i. Government Support**

Government's infrastructural assistance for the adoption and application of information technology in SMEs (Nemeth, 2019). Firms anticipate that government policy will be supportive of the seamless implementation of ICT. If a specific budget is set up for ICT adoption in SMEs, it is predicted that ICT adoption would be simpler (Cozzarin, 2022). In the literature, there are various examples of government interventions.

#### **2.4.5.2 Factors influencing ICT adoption at individual level**

##### **i. Perceived Usefulness (PU)**

The degree to which a person feels that using a given system will improve his or her job performance is referred to as perceived usefulness (Calvo-Porrall, & Pesqueira-Sanchez, 2022). Perceived usefulness was found to influence service uptake and desire to continue using services (Abdurakhimovna et al., 2021). According to Tiwari et al. (2020), the key condition for mass-market technology acceptance is perceived utility, which is dependent on customers' expectations about how technology may enhance and simplify their lives.

##### **ii. Perceived Ease of Use (PEOU)**

The degree to which a person feels that utilizing a certain technology would be painless is referred to as perceived ease of use (Calvo-Porrall, & Pesqueira-Sanchez, 2022). Several studies have used various use measurements, and the beliefs have a strong relationship with attitude (Calvo-Porrall, & Pesqueira-Sanchez, 2022).

##### **iii. Perceived Enjoyment**

Perceived enjoyment is an internal source of motivation, referring to the performance of an activity for no apparent reason other than the process of doing itself (Tiwari et al., 2020). According to Calvo-Porrall and Pesqueira-Sanchez (2022), an easy-to-use system is seen as more enjoyable than one that is difficult to use.



#### **iv. Risk Acceptance**

Tiwari et al. (2020) describe risk acceptance as the respondent's willingness to submit personal information to online organizations such as websites and can be characterized as an individual's tendency to provide personal information to participate in online marketing efforts to obtain gifts, enter a contest, or earn future discounts. According to Calvo-Porrall and Pesqueira-Sanchez (2022), developing trust between customers and marketers, as well as giving consumers some choice over the exposure of their personal information in an online context, may minimize privacy concerns.

#### **v. Social Norms**

Societal norms are defined as a person's impression of the social constraints placed on him to conduct or refrain from performing the in-question behavior (Calvo-Porrall, & Pesqueira-Sanchez, 2022). Several studies have found that social norms have an impact on adoption and willingness to continue using financial services (Tiwari et al., 2020).

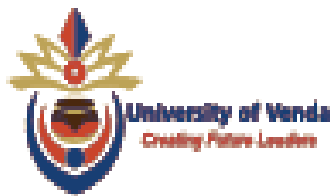
### **2.5. Factors affecting marginalized groups of people from adopting to ICT**

#### **2.5.1 Community entry phase**

ICT initiatives should begin with consultation with the local community members and idea generation with such end users (Fouche et al., 2022). Cultural interpreters, community leaders, visionaries, champions, and entrepreneurs should be included in the community entrance phase (Aruleba & Jere, 2022). All stakeholders must be involved in the beginning of the project with the community, and an effort should be made to establish connections among the various stakeholders (Nyoni, 2019). This implies that the multi-stakeholder engagement, as well as an open and competitive environment should be promoted to local users. Securing rural community collaboration and understanding, could be necessary to raise awareness among community members about the benefits of employing ICTs.

#### **2.5.2. Analyse Socio-Economic context**

Ibenthal (2019) argues that the significance of analyzing and specifying the context in which ICT will be used such as the financial, environmental, and cultural impact studies, and capability evaluations. These studies are critical for understanding the community's socioeconomic environment and current socioeconomic situation to ensure the proper



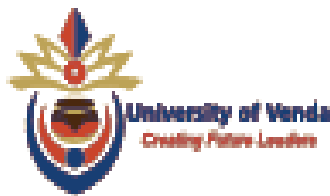
preparedness in that community (Aruleba & Jere, 2022). This interaction with community as part of the stakeholders to get insight into the setting in which ICT will be used to analyze and define the context.

### **2.5.3. Determine factors that influence conversional factors**

Conversional factors are described as the elements that impact decision-making (Nyoni, 2019). To establish these conversional elements, the analyst must first identify any external project limitations as well as political, economic, sociocultural, and technological issues are among the external project elements (Anwar et al., 2021). Developers who are not part of the local community may have different beliefs and perspectives than the community in which the ICT project will be implemented and may mistakenly presume the community's aspirations and requirements, which is critical for the success of any ICT project (Ibenthal, 2019). This may be accomplished by approaching the community and analyzing their needs and objectives. This implies that the needs and wishes of the rural community must be prioritized in ICT programmes. Project investors should be clear about their aims and efforts, and there should be no conflict of interest between the investors and the local community.

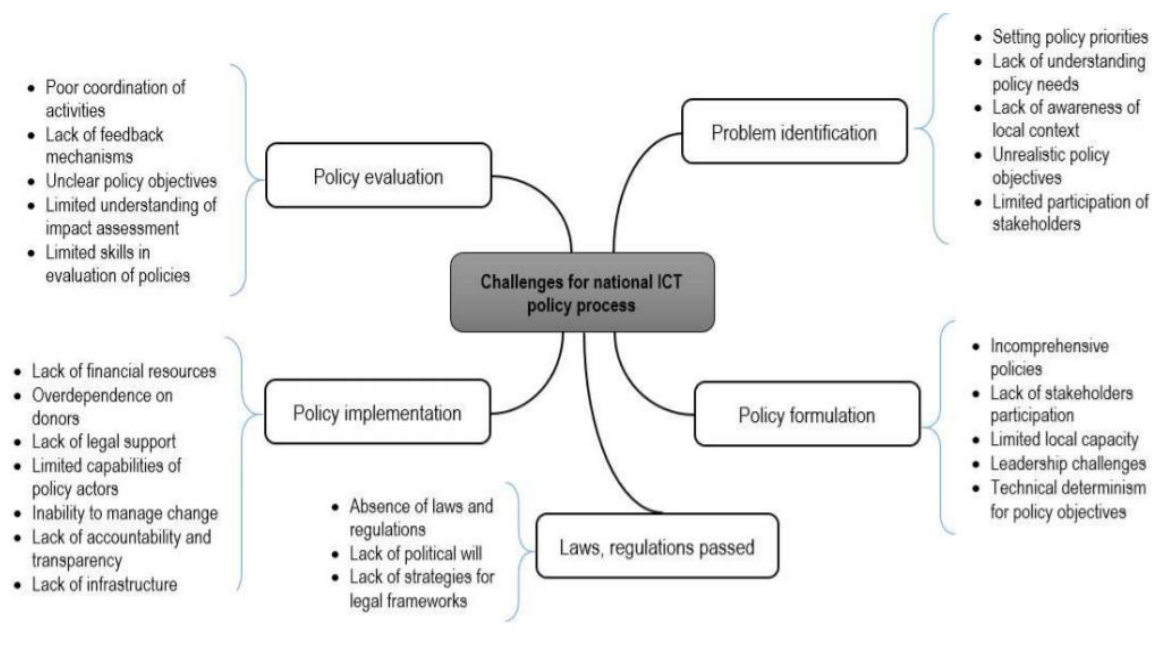
### **2.6. Regional ICT regulation in the Southern African Development Community (SADC)**

One of the numerous effects of globalisation in the communications sector is the rise of Independent Regulatory Agency (IRAs) in South Africa (Mlambo, 2022). IRAs have lately been established in developing countries like as South Africa because of globalization (Gillwald et al., 2018). In response to the global publicity around technology convergence, the Independent Broadcasting Authority (IBA) in 1993 and the South African Telecommunications Regulation Authority of South Africa (SATRA) in 1995 were formed. South Africa has been a leader in the development of IRAs in the communications sector, which was considered to have forced regulatory convergence, the two IRAs were merged in 2000 to form South Africa and the composite ICT regulator the Independent Communications Authority of South Africa (ICASA) (Howell & Potgieter, 2022). In 2019, the ICASA was last updated (Hart et al., 2020). The Regulations on Party Election Broadcasts, Political Advertisements, and the Equitable Treatment of Political Parties by Broadcasting Service Licensees were published in the government gazette on February 25, 2019 (ICASA, 2020).



## 2.7. Challenges of regional ICT policy

Regional ICT strategies for rural areas are increasingly being implemented, although the policies have not generated the expected effects (Kunyenje and Chigona, 2022). The policies have been devised, but their implementation has continually failed, resulting in policy objectives not being accomplished (Ajibade & Makinde, 2019). Several studies in the literature highlight some of the barriers to getting optimal policy results (Makoza, 2022). A lack of policy monitoring and evaluation, a lack of policy vision and leadership, inconsistencies between ICT policy goals and national development goals, a lack of skills for policy actors to articulate a course of action, limited legal frameworks to support policy implementation, and a lack of basic infrastructure to support policy implementation are among the challenges (Gorkey and Berker, 2020).

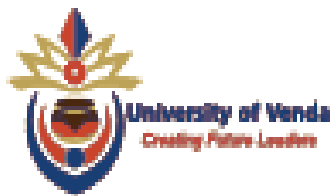


**Figure 2.1. Summary of challenges in ICT policy** (Makoza & Chigona, 2013)

### 2.7.1. Regional ICT policies and regulatory bodies on ICT

#### a. Contribution to the Broader ICT Regionalization Literature

An overemphasis on one region risks relying on ideas and conceptions developed in that region that may not be appropriate in other places (Acharya, 2019). As a result of varied regional structures and the impact of parliament members with varying degrees of development on the



region, the region's different features may result in different effects on local ICT policy making and regulation (Carmody, 2019).

### **b. The Increasing Role of Voluntary Policy Coordination**

Voluntary policy coordination has been proven to be more effective than other areas without enforcement authority, such as SADC, in promoting policy transfer by direct or coercive methods. Increased flexibility, nonbinding coordination, benchmarking, and policy learning (Leite, 2021).

#### **2.7.2. Discourses in policy implementation**

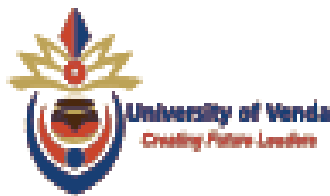
Discourses in the context of policy implementation is described as a portion of knowledge that influences policy stakeholder's decisions for what to think, say, and do (Sundberg, 2019). Discourses are considered to include contradictions and tensions that might challenge current social conditions and encourage new ways of thinking and behaving (Chipidza, & Leidner, 2019). Evaluating text such as policy papers and legislative documents, vocal communication such as press releases, reports, and interviews, and observing cultures, norms, or practices are all approaches to analyze discourses (Leite, 2021). The multidimensional understanding of discourses facilitates data comparison to eliminate biases when determining whether discourses are favoured or marginalized.

#### **2.7.3. Problematisation in policy implementation**

Problematisation may be used to explore how particular concerns connected to policy execution are addressed and how they impact the exercise of power through discourses (Chipidza, & Leidner, 2019). Acharya (2019) contends that when persons are engaged in problem-solving thought, it extends beyond mental, cognitive, and linguistic phenomena to incorporate social actions.

#### **2.7.4. Regimes of truth in policy implementation**

New discourses about policy programmes and procedures may be recognized, and how they are undermined and subordinated can be explained (Carmody, 2019). In other words, ICT policy stakeholders' methods for influencing, questioning, and resisting policy choices and actions that are in line with or contradict their interests and roles may be examined (Acharya, 2019).



### **2.7.5. Technologies of the self in policy implementation**

According to Carmody (2019), it is essential what individuals do to make their lives meaningful and consistent with commonly accepted norms and practices in policy implementation. The policy actor's style of being, as manifested by specific behaviours in which individuals work on their wants and desires, has consequences for how they exert power with others and institutions (Leite, 2021). This implies that when policy stakeholders embrace or reject specific discourses, it may imply that they support or undermine certain truth regimes, which can impact how they think and act toward themselves and others.

### **2.7.6. Resistance in policy implementation**

According to Legg (2019), the resistance to policy does not have to come from another place in order to be genuine, nor is it unavoidably thwarted by being a power compatriot. It exists more because it is in the same location as power and resistance, is multifaceted and may be integrated into global tactics.

## **2.8. Regional competitiveness**

Regional competitiveness is defined as a region's ability to compete with one another areas based on the goals that they wish to attain (Kitson, 2019). According to Bathelt and Storper (2022), the definition of regional competitiveness is addressed as place competitiveness, which connects the idea of competitiveness to attractiveness. A region's functionality is determined by the density of its economic activity, social possibilities, and interpersonal opportunities (Cunningham, 2022). According to Sterner (2019), policymakers should assess competitiveness in terms of dynamic progressiveness, innovation, and the ability to alter and develop their region. The argument is also relevant at the regional level such as Vhembe district because regions oversee developing policies to promote and foster economic growth and social development to improve their competitive position in the global economy, they are expected to develop policies that create a favourable environment for the economy to emerge, develop, and improve.

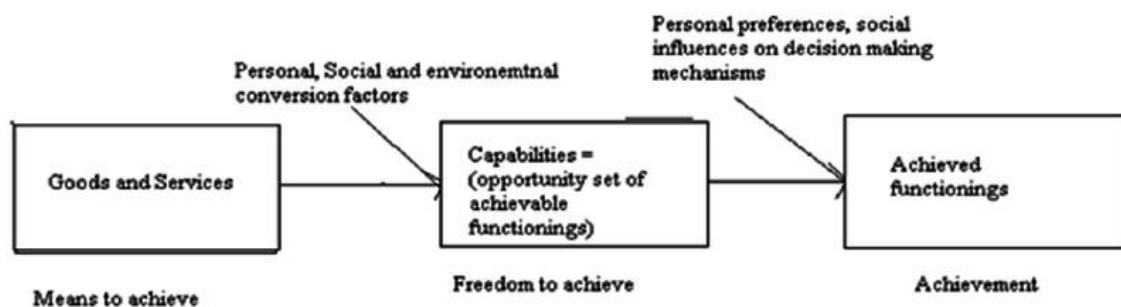
## **2.9 Theoretical Framework of the study**

### **2.9.1 Amartya Sens Capability Approach (CA)**

The CA is a wide framework for analyzing and measuring human well-being and social arrangements, establishing policies, and making social change recommendations in society



(Klein, 2018). CA is composed of two major components: 1. the functions, which are the beings and doings, and 2. the capabilities, which are concerned with the possibilities and freedom to carry out those functions (Sarpong, Eyres and Batsakis, 2019). The CA stresses the role of technology in ICTCB research in improving people's ability to operate in their society's development outside of economic progress or modernization (Nikou et al., 2020). According to Singh and Chudasama (2020), personal conversion factors are personal characteristics such as physical condition, sex, reading skills, and intellect that are used to turn commodities into a functioning.



**Figure 2.2 Core Elements of the Capability Approach (Singh et al., 2018)**

### 2.9.2 Frameworks to operationalizing Sens CA

Sen's CA pushes for a collaborative approach to the process and results of development (Nikou, 2020). CA is becoming more popular in a range of countries (Singh and Chudasama, 2020). According to Fukuda-Parr and Cid-Martinez (2019), there are many types of CA applications that have been classified: (1) evaluating small-scale development projects, (2) identifying the poor in developing countries, (3) assessing poverty and well-being in advanced economies, (4) deprivation of disabled people, (5) assessing gender inequalities, (6) debating policies, (7) critiquing and evaluating social norms, practices, and discourses, and (8) functions and capabilities as ideas in non- normative research, which is consistent with the findings. Tshivhase (2019) explains how scholars have sought to operationalize the capability approach in ICTCB and how the capability approach is used in ICTCB.

#### a. Central Human Capabilities (CHC)

Through a process of self-reflection and critical analysis, ICTs can play a direct and significant role in increasing impoverished people's critical consciousness and self-esteem (Carpenter,



2022). Specific outcome metrics for impoverished people's psychological empowerment through ICTs include i) greater capacity to analyze and solve issues, ii) higher self-esteem, and iii) a sense of involvement in the modern world (Yaxley, 2020). This aspect of empowerment is critical for improving a person's ability to influence strategic life decisions, which is a key idea of empowerment (Iliya, 2021).

#### **b. Alternative Evaluation Framework (AEF)**

The AEF highlights the importance of conceptualising technology adoption and the information utilized to construct these ICTs (dos-Santos-Tavares, 2021). Kapondera (2019) emphasizes that livelihood resources determine an individual's or a society's ability to convert valued functions into realized functions. According to Kapondera (2019), access to ICTs for the underprivileged does not result in advantages; nevertheless, to achieve the full potential of these ICTs, they must be focused on the reality and needs of the people. The AEF considers the socioeconomic position, demography, cultural and political environment, ICT diffusion, and existing ICT policy structures (Eskelund, 2019). The right to information and knowledge is important, and its failure can lead to poverty; nevertheless, it must be considered in the context of existing social and economic inequality, which can be exacerbated by technological improvements (Kang & Svensson, 2021). ICTs are not utilized to eradicate poverty, but they may be used to enhance the lives of the poor in certain ways (Petersen, 2020). This framework, in my perspective, examines how an ICT intervention improves an individual's informational capacities.

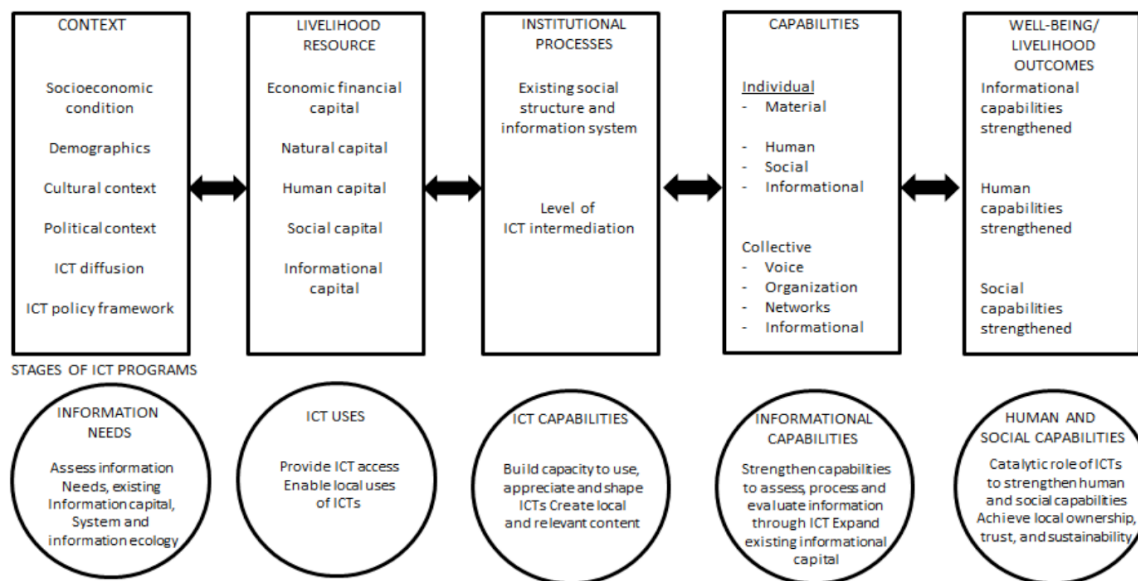


Figure 2: *Alternative evaluation framework (Gigler, 2015, p 32)*

**Figure 2.3 Alternative evaluative frameworks for the impact of ICTs on well-being (Tshivhase, 2019)**

**c. The Choice framework (CF)**

A choice framework was created to enable the operationalization of the capabilities approach by taking human development, technologies, and fair trade into account. It is built for the life we cherish (Kleine, 2019). The CF provides a comprehensive view of growth that may be used to assess capacity building (Sein, 2019). It regards progress as the process of extending people's true freedoms (Sarpong, Eyres and Batsakis, 2019). The term development is referred to the ability to make decisions based on one's own preferences (Kleine, 2019).

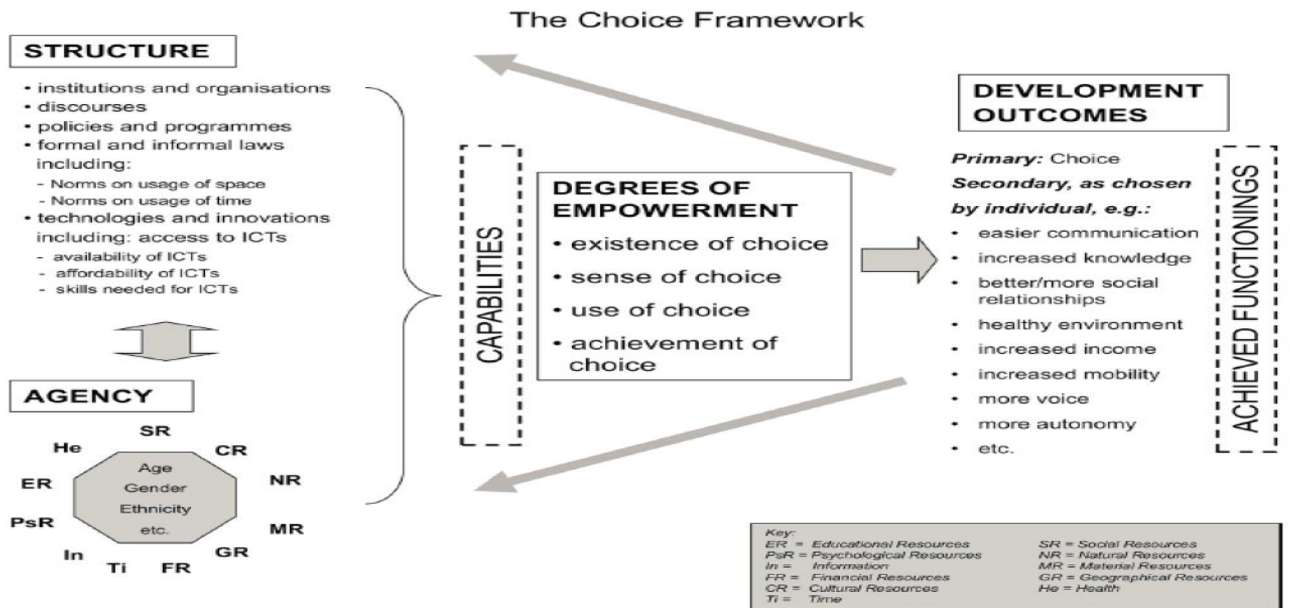


Figure 2.4: The choice framework (Kleine, 2019)

**d. An evaluative framework**

Tshivhase, Turpin, and Matthee (2020) and Hatakka and De (2011) developed a method for evaluating ICTCB projects based on Sen's CA, emphasizing the differences between achieved and prospective functioning as well as the role of technology in the CA. The framework's essential components are conversion factors, competence set, preference, accomplished functions and intervention (Singh and Chudasama, 2020). The intervention includes technology as well as support and practice, and conversion factors, which comprise personal, societal, and environmental elements, can either empower or constrain an individual's qualities (Tshivhase, 2019).

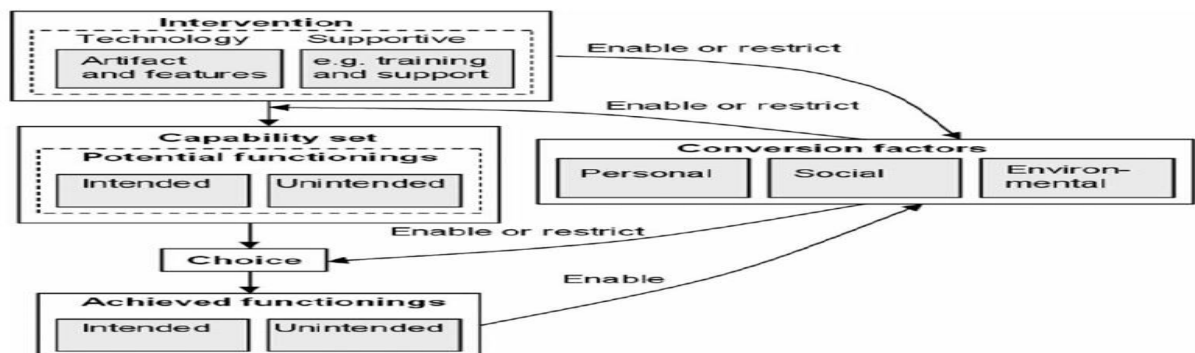


Figure 2.5: An evaluative framework by Hatakka and De, (Tshivhase, 2020)



### **e. Conviviality approach**

Conviviality is described as an individual's capacity to engage creatively and freely with people and their environment to meet their own needs (Bonini and Mazzoli, 2022). This theoretical approach is useful for concretizing concepts derived from Sen's (1973) concept of conviviality (Lange and Santarius, 2020). Conviviality is defined as a break from the discourse that accepted the industrial method of production and consumption as the status quo of human existence and proposed an alternative, which he called conviviality, which is to allow individual's greater ability to exercise their freedom of expression (Riis and Brodersen, 2021). The conviviality is described as autonomous and creative interplay among people, as well as interplay between people and their environments, as opposed to the conditioned reaction of people to the demands imposed on them by others and by a man-made environment (Pansera et al., 2019). Stojanova et al. (2022) state that, the underlying ethical value of human freedom expressed in personal interaction is described as conviviality. According to Antoniadis (2019), there is a widespread perception that once conviviality is dropped below a certain level, no amount of industrial productivity can adequately supply the requirements it produces among society's members. Illich's concept of conviviality anticipates individuals being able to enjoy their own freedom, contribute to the world in which they live, care for themselves without relying too much on those in authority and objects, and be creative and inventive in general (Hayes, 2019). The phrase convivial tools directly addressed the concept of social and artifactual constructed environments (Semeradova et al., 2022). The opposed to artifacts and created or constructed surroundings that took away people's freedom and led to their exploitation (Bonini and Mazzoli, 2022). According to Beinsteiner (2020), a convivial society should be created to allow all its members the greatest autonomous activity using instruments that are least controlled by others. Beyond a certain point, the expansion of tools creates regimentation, reliance, exploitation, and helplessness (Pansera et al., 2019). Illich also stated that a desire to create situations that were genuinely motivating, that provided people joy rather than simply pleasure, and that compelled them to express themselves freely (Mehra, 2022). The concept of control and power was important to his theory of a convivial society, and the change in control caused by the emergence of industrial society led to his discontent with the status quo (Kourtit et al., 2021).



### **2.9.3 Beyond needs and access of capabilities and conviviality for capacity building**

Capabilities and conviviality are given disproportionate emphasis in current development discourse on meeting the basic needs of users in low-resource environments, with insufficient attention paid to user-motivated concerns that would enrich their lives rather than simply providing access and having to meet basic needs. (Mehra, 2022). Jallouli et al. (2021) emphasize the need to design ICTs that promote human development by enabling users to help themselves and making wise use of existing resources. According to Schandorf (2019), for effective use of ICTs, users must have the capacity and opportunity to successfully integrate ICTs into the achievement of personal or community goals. According to WongVillacres et al. (2020), a divide is created when people have physical access to ICTs but lack the extra resources needed to effectively use that technology. For this study, the concept of social inclusion was used to express that not only should users engage in selecting how resources are used, but they should also be allowed to participate even if they do not have an equal share of resources. This level of integration is only possible if designers shift their focus from ICT for an individual user or even a user within a context, or user as a social actor, to user as collective, where, to even begin to understand the user, we must examine the collective formed out of others and the context in which the user is embedded (Okello, 2021).

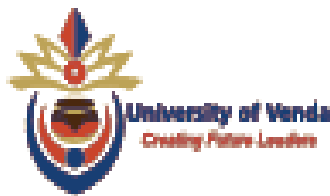
### **2.10 Conceptual Framework for the Study**

Based on the Sens capability approach model in Figure 2.5, the researcher proposed a conceptual framework for this study.

#### **2.10.1 Conceptual model of capability approach**

##### **a. The use of ICT in marginalized communities (U-ICT-MC).**

ICTs have broad characteristics which influence the usage of ICTs (Woo, 2020). The use of ICT in marginalized groups of people is affected by 1. the access to ICT, thus the access to proper ICT infrastructure available for them to use, 2. The ICT skills that will enable the disadvantaged people to use the technology which is provided to them. According to some empirical research, the education level and skills of a country's labor force are the most important factors in its capacity to accept and efficiently use new technology (Mithas, 2020). Communities with major gaps in these areas may never be able to fully realize the possibilities of technological progress (Akhvlediani & Cieslik, 2020), 3. The price value of the ICT device



and services, taking into account that some people in disadvantaged areas cannot afford to properly sustain their lives which makes it difficult to buy ICT services, 4. Individual differences, in Vhembe district municipality, here is a variation of people in traditional communities such that their behaviors towards ICTs is limited and is influenced by the gender roles in their communities, geographical location which makes it difficult for them to have a proper network coverage and the difference in religions, some religions devalues technology by restricting their people from having full control over their technological devices with the notion that technology is evil, 5. ICT Policy and regulations which governs and implement laws for the regions which need development, regional ICT policies does not cater for local needs. This makes it difficult for disadvantaged communities to use ICTs and 6. the individual choices, Individual liberties are enlarged through development, which refers to what a person is free to do and achieve in pursuit of whatever aims or ideals he or she finds important (Boyadjieva and Ilieva-Trichkova, 2018). Technology might be presented to people, but their willingness to use such technology is based on their personal choices. Certain communities may be equipped with inadequate education, low-quality human capital, cultural restrictions, an unfavorable institutional and legal framework, or simply location, all of which can significantly delay the deployment of new technology (Nguyen et al., 2022).

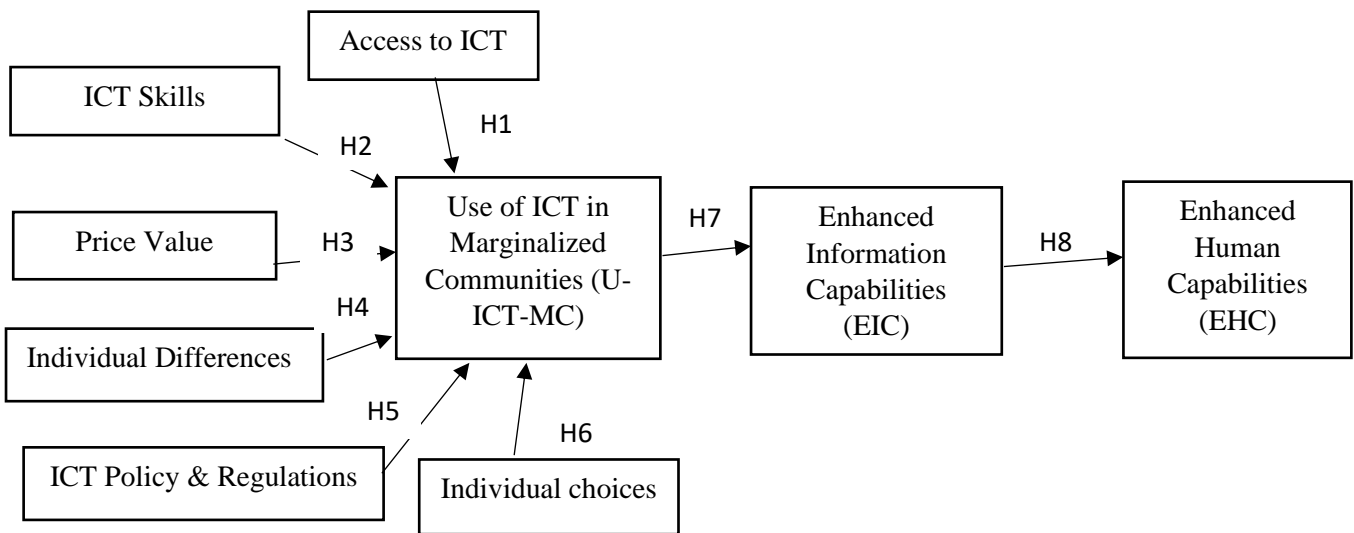
#### **b. Enhanced information capability (EIC)**

The enhanced informational capabilities, individuals will be able to expand their control over important life choices. In this view, information and ICTs may help to rural people's empowerment (Haenssger & Ariana, 2018). The use of ICTs will allow the marginalised people to have enhanced information about technology and what is happening in the world. ICTs should be comprised of local and relevant content so that local users can be attracted to use ICT devices. Enhanced information capabilities will present the marginalised groups with the potential to make the most out of the digital technologies available to them, by adapting to new ways of doing things as technologies evolve and this will be limiting the risks to themselves and others in a digital environment that they will be using, thus ICT capabilities. Enhanced information capabilities will enable people in disadvantaged areas to have better ability for understanding each other while interacting to reach a common ground and connecting with other's experience. This will help them to be more informed about what is happening in the world.



**c. Enhanced Human capability (EHC)**

The enhanced information will enhance human capabilities by empowering individuals to participate in decisions regarding politics, social development, and economic development. EHC will improve the capacities of people at an individual level. This freedom will restore the human function to a normal level, thus allowing individuals to feel empowered in a way that they can participate in economic, social and. Enhancement refers to processes that facilitate exceeding our normal human capacities.



**Figure 2.6: Conceptual model of Capability Approach**

**2.10.2 Hypothesis**

Based on the proposed conceptual framework in Figure 2.6, eight hypotheses were proposed for this study:

H1<sub>0</sub>: Access to ICT has influence on use of ICT in marginalized communities.

H1<sub>A</sub>: Access to ICT does not have influence on use of ICT in marginalized communities.

H2<sub>0</sub>: ICT Skills have influence on use of ICT in marginalized communities.

H2<sub>A</sub>: ICT Skills do not have influence on use of ICT in marginalized communities.

H3<sub>0</sub>: Price Value has influence on use of ICT in marginalized communities.

H3<sub>A</sub>: Price Value does not have influence on use of ICT in marginalized communities.



H4<sub>0</sub>: Individual differences have influence on use of ICT in marginalized communities.

H4<sub>A</sub>: Individual differences do not have influence on use of ICT in marginalized communities.

H5<sub>0</sub>: ICT policy and regulations have influence on use of ICT in marginalized communities.

H5<sub>A</sub>: ICT policy and regulations do not have influence on use of ICT in marginalized communities.

H6<sub>0</sub>: Individual choice has influence on use of ICT in marginalized communities.

H6<sub>A</sub>: Individual choice does not have influence on use of ICT in marginalized communities.

H7<sub>0</sub>: Use of ICT in marginalized communities (U-ICT-MC) have influence on Enhanced Information Capabilities (EIC).

H7<sub>A</sub>: Use of ICT in marginalized communities (U-ICT-MC) do not have influence on Enhanced Information Capabilities (EIC).

H8<sub>0</sub>: Enhanced Information Capabilities (EIC) have influence on Enhanced Human Capabilities (EHC).

H8<sub>A</sub>: Enhanced Information Capabilities (EIC) do not have influence on Enhanced Human Capabilities (EHC).

### **2.10.3 Variables**

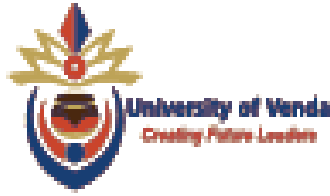
#### **i. Independent Variable**

The variable that can be adjusted in research is known as an independent variable. It is referred to as independent since its value is unaffected by the condition of any other variable in the experiment and you have control over it (Lubis & Ningsi, 2022).

In this study, the independent variable is the use of ICT in Marginalized Communities (U-ICT-MC). Marginalized groups have the capability to use ICT provided to them.

#### **ii. Dependent Variable**

The dependent variable is defined as the variable being measured; you are evaluating how it responds to a change in the independent variable, so you may think of it as dependent on it (Roman et al., 2019).



The dependent variables of this study are the access to ICT, ICT skills, price value, individual differences, ICT policy and regulations, and individual choice.

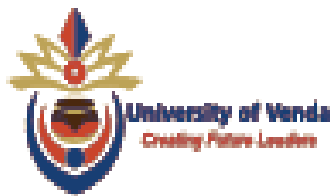
## **CHAPTER 3: RESEARCH METHODOLOGY**

### **3.1. Introduction**

This chapter outlines in detail the methods that will be applied when conducting the study. Research methodology is a systematic process for the collection and logical analysis of data for a given purpose (Baydas & Cicek, 2019). Research method is the study of methods in which knowledge is gained (Moradi, 2019). The process of conducting research involves gathering, analysing, and interpreting data to address specific research questions (Gleeson, Neville & Pope, 2020). Research methods are the basic processes and strategies used in research to obtain data and solve problems. It is the method of determining how to do research (Rajasekar et al., 2022). This chapter explains the research design, the study population, sampling methods, data collection procedures and instruments used, data analysis methods, reporting and ethical issues adhered. Research methodology is the systematic process of collecting and logically analysing data for a given purpose.

### **3.2. Research paradigm**

The research paradigm describes an individual's belief system. A research paradigm expresses the researcher's underlying opinions about the environment in which he or she lives and aspires to live (Kamal, 2019). A researcher must be able to confront several issues in his or her search for the truth to explain the underlying research paradigm. The first is the need to understand the nature of reality and truth in the world in which we live referred to Ontology. The second focus in trying to grasp research or philosophical perspectives is epistemological, which is concerned with how researchers obtain knowledge or the reasoning process of acquiring knowledge. Ontology and epistemology are to research what foundations are to a house, they are the basis of the entire structure (Singh, 2019).



### **3.2.1. Ontology**

Ontology is the study of the nature of our views about reality (Ndlovu, 2021). Crotty, Buchanan and Herschell (2021), describe ontology as the study of existence. Ontological assumptions are concerned with what makes up reality, or what is real. Researchers must take a stand on their perceptions of how things truly are and how they operate (Khatri, 2020). By emphasizing thoughts about human reasoning and beliefs about social interactions, ontological beliefs bring to light the core of the events under study (Alharahsheh & Pius, 2020). Individual meanings, interpretations, and reflexive behaviours are an essential part of the causes at work in each situation (Kanvaria & Nagpal, 2019).

### **3.2.2. Epistemology**

Epistemology is the study of the nature of knowledge and the process by which information is acquired and validated (Moahi, 2022). Epistemology is focused on the nature and types of knowledge, how it may be gained, and how it can be transmitted to other humans (Singh, 2019). The epistemological question encourages a researcher to consider the potential and desirability of objectivity, subjectivity, causation, validity, and generalizability (Kamal, 2019). Epistemological assumptions are concerned with how knowledge can be created, acquired, and communicated, in other words what it means to know. Moahi (2022) explains that epistemology asks the question, what is the nature of the relationship between the would-be knower and what can be known? The concept of knowledge described as epistemology stresses how we get knowledge and how we can tell what is true from what is untrue (Wiltshire & Ronkainen, 2021). Epistemological approach stresses that ICTs may be applied in a way that enables various knowledge systems to coexist side by side, creating the battlefields of knowledge (Lin, 2022).

This study adopted the positivism paradigm. Positivism emphasizes that reality exists independently of people, so in this study the ICT pricing value. ICT policy, one of the factors in this research, which is used to implement unchangeable rules that regulate positivism, which is not controlled by human senses. Realism is the ontological viewpoint held by positivists. The variable individual differences in this study support the notion brought forth by positivists that the social world may be understood in the same way as the natural world. The epistemic



perspective of positivists is one of objectivism. The positivist paradigm assumes that to gather objective facts or knowledge, a researcher should study and assess a stable reality under systematic, logical, and serious criteria (Brinol and Petty, 2021). This research used the quantitative approach. When it comes to quantitative analysis, positivism includes hypothesis testing to find the objective reality (Gamlen and McIntyre, 2018).

### **3.3. Research approach**

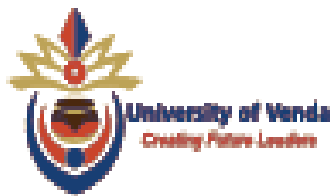
Research is the process of collecting, analysing, and interpreting data to get a better knowledge of a topic in which we are interested or concerned (Fauzi and Pradipta, 2018). The research approach guides the researcher in deciding what type of data is required for a study and which data collection tools will be most appropriate for the purpose of his/her study. Research approach as a set of plans and procedures for conducting research that range from general assumptions to specific data collection and analysis methods (Pule, Sarantou and Vella, 2021). According to Mohajan (2018), there are three common approaches to study design namely quantitative research approach, qualitative research approach, and mixed methodology research approach.

#### **3.3.1 Qualitative Approach**

Qualitative research is a type of research that the researcher puts emphasis on socially constructed nature of reality, the close relationship between the researcher and the subject of study, and the constraints imposed by the study (Denzin, 2019). Alase (2017) argues that the qualitative research comprehends and evaluates the importance that certain individuals place on a research context. This is a type of study that looks at people's personal experiences, perceptions and how they feel about a specific aspect (Van den Berg and Struwig, 2017). The goal of a qualitative research is to develop a thorough knowledge of human behaviour and the variables that affect it (Mohajan, 2018).

#### **3.2.2 Quantitative approach**

Quantitative research is referred to as the ability to reason with numbers and other statistical principles (Jeffries, 2019). Qualitative research examines the relationships between various variables that can be calculated using instruments to evaluate study objective theories (Kakuru, 2019). The data were collected in the form of questionnaires and the results were analysed



using statistical tools to make figures, tables, and graphs. The quantitative approach assumes that the events under study have certain mathematical distributions (Denzin, 2019).

### **3.3.3 Mixed methods approach.**

In a mixed methods analysis, researchers collect and analyze both quantitative and qualitative data (Schoonenboom and Johnson, 2017). According to Schoonenboom, Johnson and Froehlich (2018), the ability to use both qualitative and quantitative approach at all levels distinguishes mixed methods research from the closely related multimethod research, which only involves mixing at the level of methods, either qualitative or quantitative.

To understand the social meaning of the information systems in use, the analysis will use a quantitative research approach (Lin, 2022). The fields of study in the literature review were investigated to gain a deeper understanding of ICT growth and development in marginalized groups of people living in South Africa. Quantitative research emphasizes that the current scientific analysis and interpretation of the properties of phenomena and their relationship is focused on the calculation of data in numbers using mathematical models and theories (Jeffries, 2019). The current research considered the application of quantitative approach because it defined the features limiting people from using ICT service and resources in disadvantaged areas of the Thulamela and Makhado municipality. In assessing the usage of ICTs in rural areas, numerical data on the number of respondents using ICT services was recorded and calculated using a statistical analysis tool. The word rural is intended to mean places with rural characteristics, such as: low levels of services such as transport, water and medical services, non-urban settlements such as riparian Villages and high incidences of poverty (Ofodu, 2019). The instruments used in this study include controlled questionnaires to obtain statistical answers to the research questions of the study, such as the identification of the number of respondent's knowledge towards ICT. The purpose of this approach is to calculate data with a view to generalize the findings and measuring the sample by automated processes (Babarinde, Agbo & Fagbemi, 2022).

### **3.4 Research design**

Research design is a structure used for controlling, handling and the analysis by applying effective control over factors and issues that can undermine the validity of the study findings (Louw, Kirkpatrick & Leader, 2020). The research design helps the researcher to bring

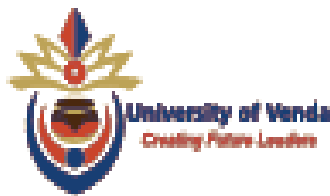


attention to all research aspects from the beginning of the research to bring convincing conclusion by answering the research questions or hypothesis (Bryant, 2017). According to Kakuru (2019), the research design supported and assisted in implementing the study in a way that enabled to obtain findings as intended. Alternatively, Gidey (2021) argues that research design should be able to yield maximum information and provide an opportunity for considering many different aspects of a problem. The research design of this study considered aspects such as the purpose of the research, the level of accuracy required in the results, and logistics, such as the cost, time and labour involved.

The study used quantitative and descriptive research approach, which are concerned about finding actualities about the impacts of using of ICT in disadvantaged areas and the factors affecting marginalised groups from using ICT in Limpopo province. Quantitative research design outlines objectivity in measuring and describing a particular phenomenon (Denzin, 2019). The descriptive approach in the selected method is used to establish associations between the studied variables and to describe the status about the selected variable. In this study, it was used to describe the impacts of using ICT in rural areas.

### **3.5. Target population**

Target population is defined as a set of comprehensive elements including individuals, events, objects, items, or organizations which theoretically describe the data to be collected, such as age, sex, race and target unit income and the findings of the survey are meant to generalize the objectives of the study (Mabaso, 2017). Mustaph (2020) argues that the population simply as consisting of all households in each community. The target population must be specifically defined, and geographic and temporal characteristics of the target population must be described in the research (Baporikar, 2020). Prasojo et al. (2019) assert that before one selects a sample, one must define the population of interest which the results will be drawn from. A population is any finite or infinite collection of individual objects which a researcher would like to generalize the results of a study. This study targeted individuals from Vhembe district, Limpopo province, South Africa. The focus areas for this study were Makhado, Thohoyandou, Thengwe and the surrounding villages within Thulamela and Makhado municipality.



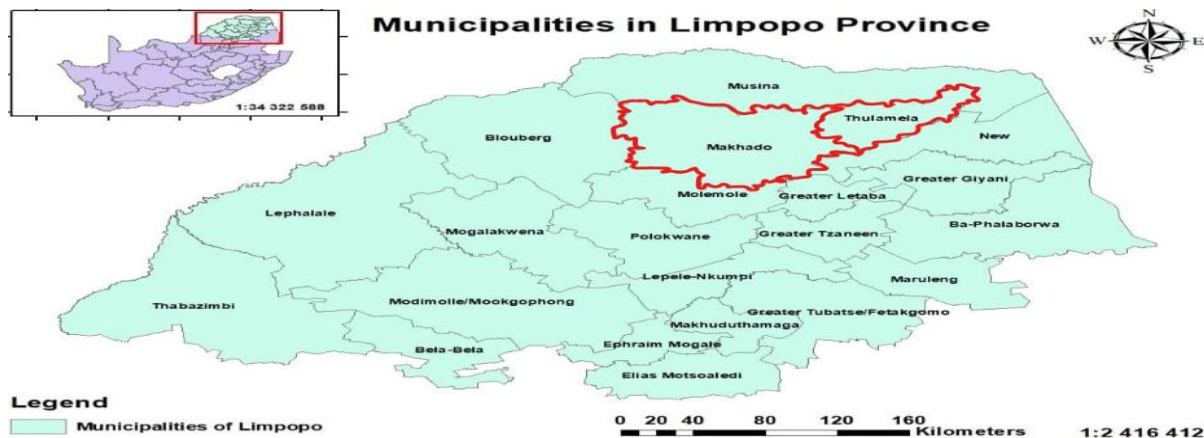
### **3.6. Sampling**

A sample is a subset of a population, while sampling is a method of collecting a population sample (Chipidza and Leidner, 2019). Sampling is described as a specific way of selecting subjects of population to be studied to reduce bias and applying inferences from findings based on a sample to a larger population (Ngoma, Keevy & Rama, 2021). Saunders et al. (2018) argue that a sample is a subset of a population, while sampling is a method of drawing sample from a population. The sample method involves capturing a representative population set and using data collected as research information (Diener, Oishi & Tay, 2018). The current study used simple random sampling to gather data from people residing in Thulamela and Makhado municipality. For this study, the sampling method was a suitable sampling method as it reduced the chances of higher costs and enabled the research to be completed quickly.

#### **3.6.1. Sample frame**

A sampling frame is referred to as a survey frame through which a medium of explicitly or implicitly identifying and communicating with elements of the survey population is provided (Naidoo & Kopung, 2020). The design of a sampling frame enables the selection of a sample from the population. According to Ngongo (2021), a sampling frame, is a tool for defining and interacting with elements of the survey population, either directly or implicitly. Levin, Fulginiti and Moore (2018) argue that a sampling frame as the source of material or device from which a sample is drawn, providing a list of all those who can be sampled within a population, and may include individuals, households, or institutions. The respondents were individuals from Thulamela and Makhado municipality, including challenged people also regarded as the disabled people, old-aged people, uneducated people, women, homelessness, problematic substance use such as alcohol and drugs and prison or offending, to compile the sample frame list in which the population sample was selected from. Yang (2021) argues that a well-defined sample frame allowed the researcher to take over the target population without having to worry of incorrect entries and records. According to Marugan, Chacon and Marquez (2019), collecting information from a sample of respondents through self-reporting, which enables participants to respond to a series of questions posed by the researcher. The current study distributed 200 survey questionnaires for data collection, 100 questionnaires were distributed to two municipalities in the Vhembe District, namely, the Thulamela and the other

100 questionnaires to Makhado municipality.

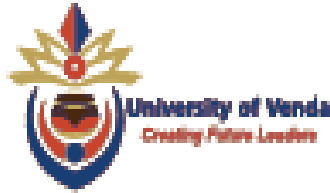


**Diagram 3.1. Municipalities in Limpopo Province with two local municipalities namely, Thulamela and Makhado municipality**

### 3.6.2. Sample size

A sample size is defined as a group of people chosen from the general population who are assumed to be representative of the actual population for the study (Schoemann, Boulton and Short, 2017). According to Schoemann, Boulton and Short (2017), the population sample size must consider the following (i) the larger the population sample size, the smaller the percentage of the population required to get a representative sample; (ii) for smaller populations ( $N < 100$ ) there is little point in sampling; (iii) if the population size is around 1500, 20% should be sampled; and (iv) beyond 5000, the population size is irrelevant and a sample size of 400 is adequate. The sample size will be suitable because the sample population will approximate the qualities and characteristics of the general population. The main categories sampled for the study included people between the ages of 15-20 years; 21-30 years; 31-40 years; 41-50 years and 51-60 years.

**Tables 3.1. Population trends in local municipalities of Vhembe district municipality: Adapted from Integrated Development Programme (IDP, 2021)**



Municipalities	1996	2001	% Change	2011	% change	2016
Vhembe	1 095 728	1 197 952	1.8	1 294 722	0.8	1 393 948
Thulamela	533 757	581 487	1.7	618 462	0.6	497 237
Musina	33 061	39 310	3.5	68 359	5.5	132 009
Makhado	455 597	494 264	1.6	516 031	0.4	416 728
Collins Chabane	There is no data available because municipality was established after Census 2011					347 974

### a. Determining the sample size

The sample size was determined using Slovin's Formula.

Given the total population of 1 393 948 residents between the ages of 18-65 in Vhembe district Municipality, the researchers used a confidence of 95% for a better accuracy, which gave a margin error of:  $e = 100\% - 95\% = 5\% \approx 0.05$

$$n = \frac{N}{1+N(e^2)}$$

Where  $n$ = number of sample,  $N$ = Total population and  $e$ = error margin.

$$n = \frac{1\,393\,948}{1+1\,393\,948(0.05^2)} = 399.89 \approx 400$$

### Calculating for each municipality

$$n \text{ municipality} = \frac{\text{population size}}{\text{Total population size}} \text{ (Total sample size)}$$

$$n \text{ Musina} = \frac{132009}{1393948} (400) = 37.4 \approx 37$$

$$n \text{ Thulamela} = \frac{497237}{1393948} (400) = 142.68 \approx 143$$

$$n \text{ Makhado} = \frac{416728}{1393948} (400) = 119.58 \approx 120$$

$$n \text{ Collins Chabane} = \frac{347974}{1393948} (400) = 99.85 \approx 100$$



The sample size of each stratum is calculated with  $nh = (N_h/N) * n$  (Koffler, Shonfield & Vickers, 2017) where  $nh$  is the sample size stratum,  $N_h$  is the population size for stratum,  $N$  is a total population size and  $n$  is total sample size.

**Table 3.2: A table of population size vs sample size per local municipality in Vhembe**

**District**

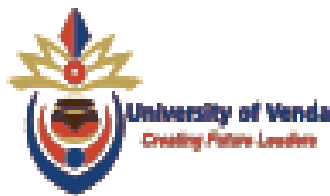
Local Municipalities in Vhembe	Population size	Sample size
Musina	132 009	37
Thulamela	497 237	143
Makhado	416 728	120
Collins Chabane	347 974	100
<b>Total</b>	<b>1 393 948</b>	<b>400</b>

**3.6.3. Sampling method**

The sample method is described as a method selecting a representative sample of the population and using the information gathered as research data (Ngcongco, 2021). The current study used a simple random sampling to gather data from the Vhembe District municipality. For this study, the method was a suitable sampling method as it reduced the chances of higher costs and enabled the research to be completed within the given time. Yang (2021) states that a sampling method is a technical accounting device used to rationalize the collection of information, and to choose in an appropriate way a restricted set of objects, persons, and events from which actual information will be drawn.

**3.7. Data collection procedures**

Data collection is a structured method of obtaining and quantifying target population data that helps the researcher to answer research questions and analyse the findings (Kakuru, 2019). The method by which the researcher gathers the data required to respond to the research questions or problems is described as data collection (Jeffries, 2019). This study used a survey questionnaire for data gathering as discussed next. The data can be collected through fieldwork



and observations from various sources, such as existing data from databases or unidentified information. The current study used both primary and secondary data.

### **3.7.1. Data collection sources**

#### **3.7.1. a. Primary data collection**

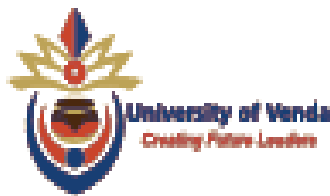
Primary data collection is defined as the process of collecting raw facts using methods such as interviews and questionnaires (Won, 2021). Primary data in this research was collected in the form of raw materials which required the use of statistics for analysis and interpretation to achieve all the objectives of this research and to answer all the research questions of this study (Kothari & Momayez, 2018). To achieve the objectives of the current study, such as determining the impacts of using ICT in rural areas, the survey data was collected using tools such as questionnaires that were distributed to individuals residing in Thulamela and Makhado municipality.

#### **3.7.1.b. Secondary data collection**

Secondary data is described as the information that has been already collected, processed, and interpreted (Kothari & Momayez, 2018). This study involved collecting secondary information from journals, books, magazines, articles, scientific papers, official statistics, databases, and government reports, among others, to provide a structure for conducting research (Lee, 2021). To investigate the factors affecting marginalised groups of people from using ICTs for growth and development, the researcher reviewed online papers, journals and documents related to the subject of this analysis.

### **3.7.2. Data collection instruments**

Data collection is described as the process in which the researcher collects information needed to answer the research questions (Ali, Zolezzi & Awaisu, 2020). Data collection instruments contain strategies for finding facts. Turkevych, (2019) states that the data collection instruments selected must be reliable and valid to avoid biased response. This study used questionnaires for data collection. The questionnaire for this study is divided into three parts namely: section A: Individual differences, Section B: Values to ICT and Section C: Human capabilities and functioning. The questionnaire contains questions that helped the researcher to test the study hypothesis and have closed ended questions related to the study objectives. Two hundred questionnaires were distributed on a snowball method.



### **3.7.2.a. Questionnaire**

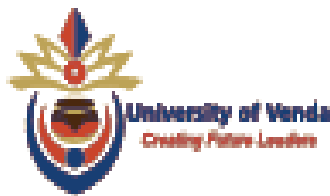
Questionnaires are made up of a collection of linked questions about a single topic or a group of topics (Shadieff & Sintawati, 2020). According to Nardi et al. (2018), questionnaires are suited for respondents who can read, for measuring people's attitudes and opinions, and for getting a very large number of respondents too difficult and time consuming to observe with qualitative methods. Debrah (2021) argues that questionnaires facilitate the collection of data by asking all, or a sample of people, to respond to the same questions. They can be in both printed and electronic forms. This study used questionnaires for data collection. The questionnaire considers respondents' privacy, respondent's personal details such as names, ID numbers are not required, all the questions are to aid in conducting research and not intended to harm or infuriate the respondents. It is clearly stated that respondent's participation is valuable to the success of this study but not compulsory therefore they can withdraw at any time. The questionnaire for this study is divided into three parts namely, section A, individual differences, section B, values to ICT and section C, human capabilities, and functioning. The data was collected on a 5-point Likert scale ranging from 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly agree. The questionnaire consisted of closed-ended questions about the study's research objectives and hypothesis that assisted the researcher in testing the hypothesis. Two hundred questionnaires were distributed to respondents in the Vhembe district municipality using a snowball technique.

### **3.7.2.b. Interview**

Interview is defined as a beneficial way of gathering data which may not be accessible through surveys or observations (Dhanani, 2020). The main purpose of interviews is to elicit the intended meaning of what the interviewees express (Chawinga & Majawa, 2018) and to further explore individual's responses (Putra, Sofendi & Sitingjak, 2022). There are three types of interviews which are structured, semi-structured, and unstructured which gives the interviewer the space to seek clarity as to what the interviewee means and why they gave a particular answer (Jarmooka et al., 2020).

### **3.7.2.c. Pilot study**

A pilot study is defined as a method that enables the researcher to recognize any errors or undesirable patterns in the questionnaire, as well as improve the questionnaire's design (Ran,



2021). A pilot study is defined as a small investigation that collects data and tests the feasibility of instruments and procedures before a larger study (Nyarirangwe & Babatunde, 2018). Pilot study is described as a mini version of a full-scale study, otherwise referred to as feasibility studies, and include the specific pre-testing of a particular research instrument, such as a questionnaire or interview schedule aimed to bring to light an understanding of the subject matter of the current research, the population it was to cover, its spatial variability, and the possible reaction to questions from respondents (Ismail, Kinchin & Edwards, 2018). A pilot study with 20 questionnaires were distributed to sampled population to enable the researcher to recognize any errors or undesirable patterns in the questionnaire, as well as improve the questionnaire's design.

### **3.8. Data analysis tools and procedures**

The purpose of data analysis is to find useful and accessible information, regardless of whether the data are qualitative or quantitative (Bossey, 2022). Through applying similar reasoning, the data analysis in the current study provided the structure, justification and meaning of the data to be collected on the impact, usage, adoption factors and value of ICT capacity building, as these are the objectives of the research (Bossey, 2022). Questionnaires, surveys, and tests were used in quantitative testing to collect data, which were then revised and tabulated in numbers, allowing the data to be characterized by statistical analysis. A descriptive statistic is a summary statistic that quantitatively explains or summarizes features of a set of data, as well as the method of using and analysing those statistics (Mohanty & Mishra, 2020). The research used descriptive statistics to summarise the quantifiable data about human capabilities on ICT and took a quantitative approach to present the results in a numeric form, in the form of graphs and pie chart. In addition to descriptive statistics, this study used Cronbach's Alpha to measure the reliability of constructs of the survey instrument and to prove that the question on each construct was consistent (Dittoh et al., 2020). To test the strength of association between constructs Phi and Cramer's V tests were used. Advanced statistical analysis using regression analysis such as one-way ANOVA and t-test were used. To establish how-well the proposed conceptual framework fits, the data collected, indices were used, that is the. The IBM Statistical Package for the Social Sciences (SPSS) was chosen for this study because of its ability to perform all the statistical analysis needed for testing the hypothesis.



### **3.9. Data quality control**

Reliability and validity are described as important terms in research since they are used to enhance the quality of a research work's assessment and evaluation (Olabode, Olateju & Bakare, 2019). Zhang et al. (2018) describe reliability as an independent since one piece of information does not contradict another piece of information from a particular source. According to Olabode et al. (2022), validity is defined as the degree to which a questionnaire or test determines what it aims to measure. The degree to which any measuring instrument calculates what it is supposed to measure is known as validity (Ishola, Obasi & Oluwole, 2019). According to Kumar et al., (2019), validity refers to a research study's or investigation's conceptual and empirical soundness, and the primary goal of all types of research is to achieve valid conclusions. The degree to which the measurements used, that are mostly questionnaires, evaluate the hypothesis being measured is known as construct validity (Gitomer, Martínez & Battey, 2021). Construct validity will show that the results of a specific test from the questionnaire predict the theoretical characteristic that it claims to predict. This study used the following quality controls to ensure that validity of the data and results, pilot study to check and establish the validity of the data gathering instrument such as questionnaire.

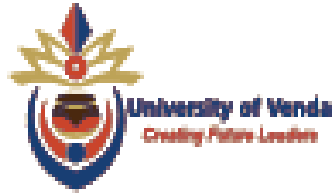
### **3.10. Ethics**

According to Ferlita (2020), honesty, anonymity, voluntary participation, right to privacy, informed consent, and protection from harm are all ethical considerations. A major source of concern is the practicality of conducting real-world research without the approval of participants and the collection of data on the study concept (Andriani & Abdullah, 2017). All researchers should understand the fundamental ethical standards and be up to date on policies and procedures designed to protect research subjects and avoid careless and irresponsible research (Andriani and Abdullah, 2017). The study was carried out in accordance with ethical guidelines. This study led by a clearance letter from the Univen Higher Degree Committee, and all respondents received consent letters stating that this is solely academic research with no financial consequences or payment for participation. Furthermore, the longer consent letter will explicitly state that participants are free to exit the survey if they feel unwilling to participate.



### **3.11. Summary**

The chapter presented an overview of the research methodology concepts. This was achieved by discussing the research methods used and the research design used, it attempted to explain and provide an understanding of the nature of the research methodology. The study used the quantitative research approach to achieve the objectives of the study by utilizing both primary and secondary methods for collecting data from the respondents. The chapter explained the sampling methods used in the study and the procedures for analysing the data. Questionnaires are the primary means of data collection from a sample of 200 participants thus individuals from Thulamela and Makhado municipality. This was achieved by using a simple random sampling technique. The statistical tool such as IBM SPSS software will be used for quantitative data analysis. Ethical considerations with regards to planned research, privacy and confidentiality, vulnerability, plagiarism, deception, trust and honesty and informed consent are strictly considered at this study. Lastly, the chapter highlighted the validity and reliability instruments. These methodologies will help to shape the premise of undertaking the fourth chapter, which will highlight in detail the analysis, interpretation and presentation of the findings using the tools mentioned above.



## **CHAPTER 4: DATA ANALYSIS AND INTERPRETATION**

### **4.1 Introduction**

This chapter focuses on analyzing and interpreting the findings on the impacts of using ICT for capacity building by the disadvantaged people in Vhembe district municipality, Limpopo province. Abubakre and Mkansi (2022) describe disadvantaged people as people who do not have the benefits and are excluded in social activities because of sex, location, poverty, disability, ethnicity, language, migration, displacement, and social situations, that others have, and therefore makes them have less opportunities to be successful. A total 200 close-ended questionnaires were distributed to ICT users in the Vhembe district municipality. Data were analyzed using IBM SPSS version 28.0.1.1(15). Data cleaning is a method for finding inaccurate, incorrect, unnecessary, missing, or noisy data and either correcting it or eliminating it from the collection (Maharana et al., 2022). In this study, the data collected from the population were carefully examined to first identify any missing data and incomplete questionnaires, then to find and fix common method bias, and lastly to find and remove any



potential irregularities and univariate normality that might distort the results. The results are presented in the form of cross tables, correlation, and graphs. The results are presented in two major sections namely, Section one presents the descriptive statistics, reliability, and validity tests, while section two presents the results on individual values towards ICT and for ICT capabilities.

## **4.2 Section A:**

### **4.2.1 Descriptive statistics**

Table 4.1 provides a summary of the demographic factors (namely gender, age group, ethnicity, disability, level of education, employment status and municipality), frequency and percentage of the respondents from the Vhembe district municipality who participated in this study. The 369 Vhembe District Municipality respondents, who participated in this research, were predominantly females (58.3%) and males (41.7%). Most respondents were between the age of 30 - 39 years (38.3%), followed by 21-29 years (32.3%). Respondents between the ages 40 years and above and 15 – 20 years, were ranked third and fourth respectively, with (23.9%) and (5.4%). Regarding ethnic groups, more Blacks (94.1%) has participation, followed by Asian group (3.2%), Colored group with (2.4%) and white with (0.3%). The disability status of respondents was based on two states, not challenged (60.3%) and challenged people (39.7%). The level of education of respondents ranged from those with national diploma (27.5%), followed by bachelor's degree (18.1%), higher certificate (16.2%), non-formal education (11.3%), primary education (11.3%), honours degree (7.8%), undergraduate degree (5.4%), master's degree (1.6%) and PhD (0.8%). Part-time employed respondents (54.1%), followed by unemployed (34.1%) respondents and full-time employed (11.9%) respondents completed this survey. Respondents residing in the Thulamela Municipality (54.7%) and Makhado Municipality (45.3%) was more concerned about the use of ICT in the municipality. The scale of socio-economic poverty in townships and rural areas resulting from the apartheid legacy is widely entrenched and shapes South Africa's current socio-economic problems (Benhmade, 2022). This understanding of the ICT4D phenomenon in South Africa may not be understood without emphasizing inequality problems.

**Table 4.1 Demographic information of respondents**

Moderator factor	Moderator Variable	Frequency	Percentage (%)
Gender	Male	154	41.7
	Female	215	58.3
Age group	15-20	20	5.4
	21-29	119	32.3
	30-39	141	38.3
	40 and above	58	23.9
Ethnicity	African/Black	348	94.1
	Asian/Indian	12	3.2
	Coloured	9	2.4
	White	1	0.3
Disability	Challenged	146	39.7
	Not Challenged	222	60.3
Level of Education	Non formal education	42	11.3
	Primary education	42	11.3
	High Certificate	60	16.2
	National Diploma	102	27.5
	Bachelor's degree	67	18.1
	Honours	29	7.8
	Masters	6	1.6
	PhD	3	0.8
	Undergraduate degree	20	5.4
Employment status	Unemployed	126	34.1
	Part time employed	200	54.1
	Full time employed	44	11.9
Municipality	Makhado	168	45.3



	Thulamela	203	54.7
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#### 4.2.2. Reliability analysis

This study used Cronbach's Alpha to measure the reliability of constructs of the survey instrument (Dittoh et al., 2020). The Cronbach's Alpha output of 0.863 for all the 38 variables in Table 4.2 shows that the tool is highly reliable as it is greater than 0.7 variance which is acceptable for a new instrument. This proves that the question on each construct was consistent, as indicated by the total number of items statistics.

**Table 4.2 Cronbach's Alpha for reliability statistics**

Cronbach's Alpha	N of Items	Comments (based on degrees reliability scale)
.863	38	High reliability

#### 4.2.3. Hypothesis testing

##### 4.2.3.1. Access to ICT and ICT Usage

**Table 4.3 Pearson's Chi-Square Tests Access versus ICT Usage**

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	173.277 <sup>a</sup>	16	<,001
Likelihood Ratio	169.856	16	<,001
Linear-by-Linear Association	7.347	1	.007
N of Valid Cases	371		

a. 13 cells (52.0%) have expected count less than 5. The minimum expected count is .73.



**Table 4.4 Phi and Cramer's V test for Symmetric Measures**

		Value	Approximate Significance
Nominal	byPhi	.683	<,001
Nominal	Cramer's V	.342	<,001
N of Valid Cases		371	

H1 0: Access to ICT has influence on use of ICT in marginalized communities.

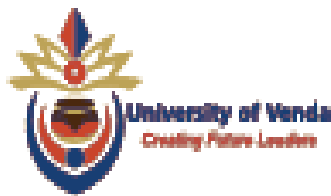
H1 A: Access to ICT does not have influence on use of ICT in marginalized communities.

Table 4.3 provides the Pearson's Chi-Square Test result for the access to ICT on the level of ICT usage. Thirteen cells (52.0%) have expected count less than 5, this violate the assumption because 52.0% is much bigger than 20% for a two-tailed test. The Likelihood ratio of less than 0.001 asymptotic significance is less than 0.05 level of significance of a two-tailed test. It hence confirms that access to ICT is closely associated with the level of ICT usage. This finding concurs with the finding of a similar study done by Adam & Dzang-Alhassan (2021), which established that, if people have access to ICT services, they might want to learn how to use these services, which may lead to digital inclusion. The findings suggest that providing individuals with access to ICTs will be enough to influence or enhance the use of ICTs. ICT access guarantee ICT usage. Furthermore, table 4.4 shows relatively large and significant (p-values < 0.05) values of both Phi and Cramer's V tests, suggesting a high strength of association between these two ICT on the level of ICT usage. Therefore, there is not enough evidence to reject the Null hypothesis. The Null hypothesis is accepted.

#### **4.2.3.2. ICT skills and ICT Usage.**

**Table 4.5 Pearson's Chi-Square Tests ICT skills and ICT Usage**

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	977.525 <sup>a</sup>	16	<,001



Likelihood Ratio	600.860	16	<,001
Linear-by-Linear Association	163.930	1	<,001
N of Valid Cases	371		

b. 13 cells (52.0%) have expected count less than 5. The minimum expected count is .65.

**Table 4.6 Phi and Cramer's V test for Symmetric Measures**

		Value	Approximate Significance
Nominal by Nominal	Phi	1.623	<,001
	Cramer's V	.812	<,001
N of Valid Cases		371	

H2 0: ICT Skills has influence on use of ICT in marginalized communities.

H2 A: ICT Skills do not have influence on use of ICT in marginalized communities.

Table 4.5 provides the Pearson's Chi-Square Test result for the ICT skills and ICT Usage. Thirteen cells (52.0%) have an expected count less than 5, and this violates the assumption because 52.0% is much bigger than 20% for a two-tailed test. The likelihood ratio of less than 0.001 asymptotic significance is less than 0.05 level of significance of a two-tailed test. It confirms that ICT skills are closely associated with the level of ICT usage. This finding disagrees with the findings of a similar study done by Aziz (2020), which confirmed that the lack of ICT skills in remote areas have negative effects on the use of ICTs. Furthermore, table 4.6 shows relatively large and significant (p-values < 0.05) values of both Phi and Cramer's V tests, suggesting a high strength of association between the ICT skills on the level of ICT usage. There is not enough evidence to reject the Null hypothesis. The Null hypothesis is accepted.



#### 4.2.3.3. ICT price value and ICT Usage.

**Table 4.7 Pearson's Chi-Square Tests ICT price value and ICT Usage**

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	617.791 <sup>a</sup>	16	<,001
Likelihood Ratio	480.209	16	<,001
Linear-by-Linear Association	61.532	1	<,001
N of Valid Cases	371		

a. 13 cells (52.0%) have expected count less than 5. The minimum expected count is .39.

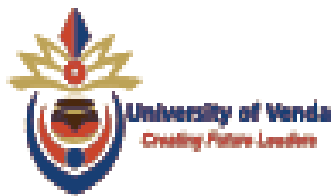
**Table 4.8 Phi and Cramer's V test for Symmetric Measures**

	Value	Approximate Significance
Nominal by Nominal Phi	1.290	<,001
Cramer's V	.645	<,001
N of Valid Cases	371	

H3 0: Price Value has influence on use of ICT in marginalized communities.

H3 A: Price Value does not have influence on use of ICT in marginalized communities.

Table 4.7 provides the Pearson's Chi-Square Test result for the ICT price value and ICT Usage. Thirteen cells (52.0%) have expected count less than 5, this violate the assumption because 52.0% is much bigger than 20% for a two tailed test. The likelihood ratio of less than 0.001 asymptotic significance is less than 0.05 level of significance of a two-tailed test. It confirms that the ICT price value is closely associated with the level of ICT usage. Seadira (2019) agrees that the price value of ICT services has a significant influence on the use of ICT in rural areas.



The high standard of living and high-cost ICT services make it hard for individuals from remote areas to choose between using money for basic needs or for using ICT services. Furthermore, Table 4.8 shows relatively large and significant (p-values < 0.05) values of both Phi and Cramer's V tests, suggesting a high strength of association between ICT price value on the level of ICT usage. There is not enough evidence to reject the Null hypothesis. The Null hypothesis is accepted.

#### 4.2.3.4. Individual difference and ICT Usage

**Table 4.9 Pearson's Chi-Square Tests for Individual difference and ICT Usage**

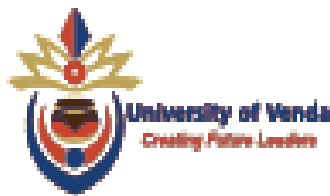
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	977.584 <sup>a</sup>	16	<,001
Likelihood Ratio	605.699	16	<,001
Linear-by-Linear Association	74.229	1	<,001
N of Valid Cases	371		

a. 11 cells (44.0%) have expected count less than 5. The minimum expected count is .65.

**Table 4.10 Phi and Cramer's V test for Symmetric Measures**

		Value	Approximate Significance
Nominal by Nominal	Phi	1.623	<,001
	Cramer's V	.812	<,001
N of Valid Cases		371	

H4 0: Individual differences have an influence on use of ICT in marginalized communities.



H4 A: Individual differences do not have an influence on use of ICT in marginalized communities.

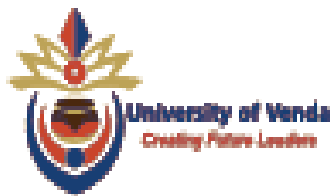
Table 4.9 provides the Pearson's Chi-Square Test result for the individual difference and ICT Usage. Thirteen cells (44.0%) have expected count less than 5, this violates the assumption because 44.0% is much bigger than 20% for a two tailed test. The likelihood ratio of less than 0.001 asymptotic significance is less than 0.05 level of significance of a two-tailed test. It hence confirms that individual difference has a close association with the level of ICT usage. This finding concurs with finding of a similar study done by Chipidza and Leidner (2019), which established that, people view ICT services differently based on the circumstances that they are facing, which might have an impact on them desiring to use ICT services. Furthermore, table 4.10 shows relatively large and significant ( $p$ -values  $< 0.05$ ) values of both Phi and Cramer's V tests, suggesting a high strength of association between individual differences on the level of ICT usage. There is not enough evidence to reject the Null hypothesis. The Null hypothesis is accepted.

#### 4.2.3.5. ICT policy and regulations and ICT Usage

**Table 4.11 Pearson's Chi-Square Tests for ICT policy and regulations and ICT Usage**

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	563.963 <sup>a</sup>	16	<,001
Likelihood Ratio	425.620	16	<,001
Linear-by-Linear Association	.690	1	.406
N of Valid Cases	371		

a. 13 cells (52.0%) have expected count less than 5. The minimum expected count is .78.



**Table 4.12 Phi and Cramer's V test for Symmetric Measures**

		Value	Approximate Significance
Nominal by Nominal	Phi	1.233	<,001
	Cramer's V	.616	<,001
N of Valid Cases		371	

H5 0: ICT policy and regulations have an influence on use of ICT in marginalized communities.

H5 A: ICT policy and regulations do not have an influence on use of ICT in marginalized communities.

Table 4.11 provides the Pearson's Chi-Square Test result for the ICT policy and regulations and ICT Usage. 13 cells (52.0%) have expected count less than 5, this violate the assumption because 52.0% is much bigger than 20% for a two tailed test. The Likelihood ratio of less than 0.001 asymptotic significance is less than 0.05 level of significance of a two-tailed test. It confirms that the ICT policy and regulations are closely associated with ICT usage. This finding concurs with findings of a similar study done by Kerr, Musiani and Pohle (2019), which established that ICT policy makers and regulatory bodies must develop policies that are practical to follow to cater for the disadvantaged groups of people. This emphasizes that ICT policy and regulations have an influence on the usage of ICT in rural areas. Furthermore, table 4.12 shows relatively large and significant ( $p$ -values  $< 0.05$ ) values of both Phi and Cramer's V tests, suggesting a high strength of association between the ICT policy and regulations on the level of ICT usage. There is not enough evidence to reject the Null hypothesis. The Null hypothesis is accepted.



#### 4.2.3.6. Individual choices and ICT Usage

**Table 4.13 Pearson's Chi-Square Tests for Individual differences and regulations and ICT Usage**

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	772.409 <sup>a</sup>	16	<,001
Likelihood Ratio	444.069	16	<,001
Linear-by-Linear Association	197.843	1	<,001
N of Valid Cases	371		

a. 12 cells (48.0%) have expected count less than 5. The minimum expected count is .65.

**Table 4.14 Phi and Cramer's V test for Symmetric Measures**

	Value	Approximate Significance
Nominal by Nominal Phi	1.443	<,001
Cramer's V	.721	<,001
N of Valid Cases	371	

H6 0: Individual choice has influence on use of ICT in marginalized communities.

H6 A: Individual choice does not have influence on use of ICT in marginalized communities.

Table 4.13 provides the Pearson's Chi-Square Test result for the Individual choices and ICT Usage. 13 cells (44.0%) have expected count less than 5, this violates the assumption because



48.0% is much bigger than 20% for a two tailed test. The likelihood ratio of less than 0.001 asymptotic significance is less than 0.05 level of significance of a two-tailed test. It confirms that Individual choices are closely associated with the level of ICT usage. This finding concurs with the finding of a similar study done by Schelenz and Pawelec (2022), which established that it is people's capability to choose what they value, while society may decide to provide access to ICTs abiding by government policies and regulations. It is the individual choice that must be involved before the ICT may be used. Furthermore, Table 4.14 shows relatively large and significant (p-values < 0.05) values of both Phi and Cramer's V tests, suggesting a high strength of association between Individual choices on the level of ICT usage. There is not enough evidence to reject the Null hypothesis. The Null hypothesis is accepted.

#### 4.2.3.7. Use of ICT in Marginalized Communities (U-ICT-MC) and Enhanced Information Capabilities (EIC)

**Table 4.15 Group statistics of Enhanced Information Capabilities (EIC)**

Group Statistics					
	Freedom	N	Mean	Std. Deviation	Std. Error Mean
ICT usability	Strongly agree	31	1.26	.999	.179
	Agree	29	3.72	.702	.130

**Table 4.16 Independent sample test of Enhanced Information Capabilities (EIC).**

Independent Samples Test											
		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	df	Significance		Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						One-Sided p	Two-Sided p			Lower	Upper
ICT usability	Equal variances assumed	.002	.969	-10.994	58	<.001	<.001	-2.466	.224	-2.915	-2.017
	Equal variances not assumed			-11.121	53.927	<.001	<.001	-2.466	.222	-2.911	-2.021

H7 0: Use of ICT in Marginalized Communities (U-ICT-MC) has influence on Enhanced Information Capabilities (EIC).



H7 A: Use of ICT in Marginalized Communities (U-ICT-MC) does not have influence on Enhanced Information Capabilities (EIC).

Table 4.15 shows the group statistics of Enhanced Information Capabilities (EIC) by the freedom to use ICT and the use of ICT in marginalised communities with a standard deviation of 0.179 for individuals who strongly agree that using ICT provides them with a lot of freedom. Table 4.16 Independent sample test of Enhanced Information Capabilities (EIC) with 95% confidence interval and standard Error difference of 0.224 for equal variances assumed.  $P < 0.001$ , Use of ICT in Marginalized Communities (U-ICT-MC) has influence on Enhanced Information Capabilities (EIC). There is not enough evidence to reject the Null hypothesis. The Null hypothesis is accepted.

#### 4.2.3.8. Enhanced Information Capabilities (EIC) and Human Capabilities (EHC).

**Table 4.17 Group statistics of Enhanced Human Capabilities (EHC).**

	Participation	N	Mean	Std. Deviation	Std. Error Mean
Freedom	Yes	287	3.31	1.083	.064
	No	84	4.00	.000	.000

**Table 4.18 Independent sample test of Enhanced Human Capabilities (EHC).**

		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	df	Significance		Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						One-Sided p	Two-Sided p			Lower	Upper
Freedom	Equal variances assumed	185.708	<.001	-5.833	369	<.001	<.001	-.690	.118	-.922	-.457
	Equal variances not assumed			-10.793	286.000	<.001	<.001	-.690	.064	-.816	-.564

H8 0: Enhanced Information Capabilities (EIC) has influence on Enhanced Human Capabilities (EHC).

H8 A: Enhanced Information Capabilities (EIC) does not have influence on Enhanced Human Capabilities (EHC).

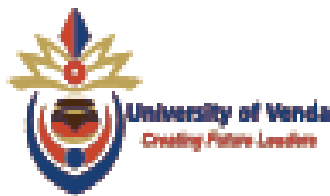
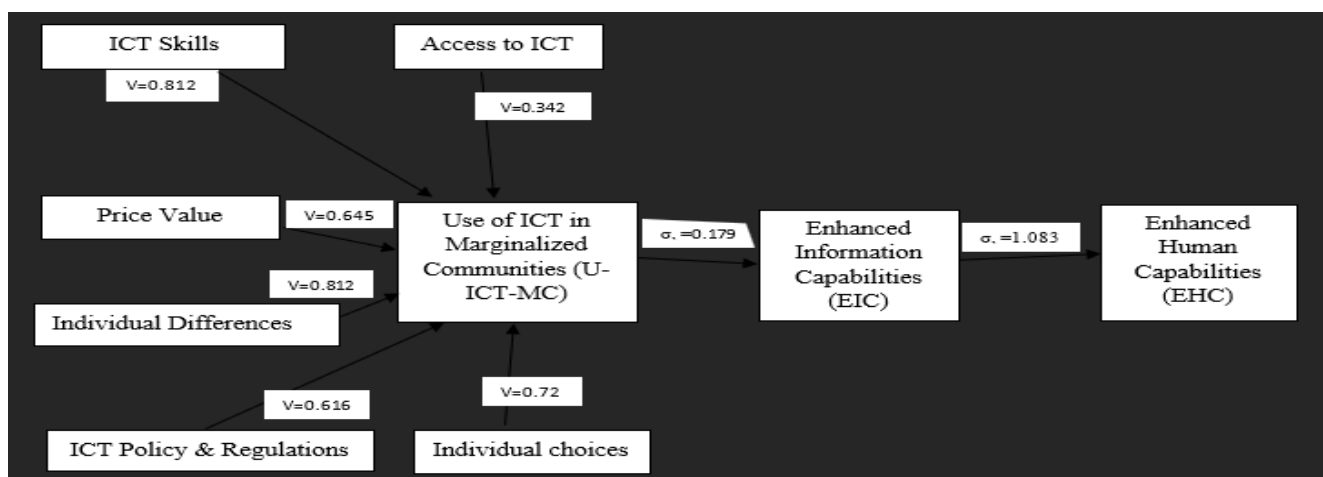


Table 4.17 shows the Group statistics of Enhanced Human Capabilities (EHC) by the freedom to use ICT and the use of ICT in marginalised communities with a standard deviation of 1.083 for individuals who strongly agree that using ICT provides them with a lot of freedom to participate in government decision. Table 4.18 shows the independent sample test of Enhanced Information Capabilities (EIC) with 95% confidence interval and standard Error difference of 0.118 for equal variances assumed.  $P < 0.001$ , Use of ICT in Marginalized Communities (U-ICT-MC) influences Enhanced Information Capabilities (EIC). There is not enough evidence to reject the Null hypothesis. The Null hypothesis is accepted.

Figure 4.1 shows the discrepancies among endogenous constructs.



**Figure 4.1: Structural model path coefficients**

#### 4.2.4. Validity analysis

Construct validity is the appropriateness of a measurement instrument in ensuring that it is effectively evaluating a particular construct being investigated (Abubakre & Mkansi, 2022). Pearson’s Correlation coefficient was used to test how valid the questions in the questionnaire were and is calculated as follows.

Sample size = N, Degrees of freedom (Df) = N-2

The condition for the question asked to be valid, Obtained value (OV) > critical value (CV).



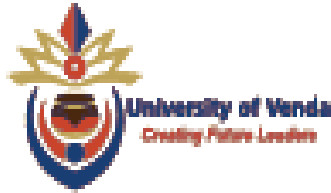
**Table 4.15 Pearson's Correlation coefficient of demographic information**

		Gender	Age	Ethnicity	Disability	Education	Employment status	Municipality	total
Gender	Pearson Correlation	1	-.745**	-.231**	.967**	.489**	.787**	.931**	.786**
	Sig. (2-tailed)		<.001	<.001	<.001	<.001	<.001	<.001	<.001
	N	371	371	371	371	371	371	371	368
Age	Pearson Correlation	-.745**	1	.277**	-.741**	-.372**	-.815**	-.754**	-.664**
	Sig. (2-tailed)	<.001		<.001	<.001	<.001	<.001	<.001	<.001
	N	371	371	371	371	371	371	371	368
Ethnicity	Pearson Correlation	-.231**	.277**	1	-.239**	.159**	-.237**	-.215**	-.370**
	Sig. (2-tailed)	<.001	<.001		<.001	.002	<.001	<.001	<.001
	N	371	371	371	371	371	371	371	368
Disability	Pearson Correlation	.967**	-.741**	-.239**	1	.497**	.803**	.901**	.803**
	Sig. (2-tailed)	<.001	<.001	<.001		<.001	<.001	<.001	<.001
	N	371	371	371	371	371	371	371	368
Education	Pearson Correlation	.489**	-.372**	.159**	.497**	1	.546**	.473**	.388**
	Sig. (2-tailed)	<.001	<.001	.002	<.001		<.001	<.001	<.001
	N	371	371	371	371	371	371	371	368
Employment status	Pearson Correlation	.787**	-.815**	-.237**	.803**	.546**	1	.755**	.714**
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001		<.001	<.001
	N	371	371	371	371	371	371	371	368
Municipality	Pearson Correlation	.931**	-.754**	-.215**	.901**	.473**	.755**	1	.740**
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001	<.001		<.001
	N	371	371	371	371	371	371	371	368
total	Pearson Correlation	.786**	-.664**	-.370**	.803**	.388**	.714**	.740**	1
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001	<.001	<.001	
	N	368	368	368	368	368	368	368	368

\*\* Correlation is significant at the 0.01 level (2-tailed).

**Table 4.16 Validation table summary**

Variable	N	DF	OV	CV	Comment
Gender	368	366	0.786	0.137	Obtained value of 0.786 is > critical value of 0.137 and is highly significant. The question based on gender is valid.



Age	368	366	0.664	0.137	Obtained value of 0.664 is > critical value of 0.137 and is highly significant. The question based on age is valid.
Ethnicity	368	366	0.370	0.137	Obtained value of 0.370 is > critical value of 0.137 and is highly significant. The question based on ethnicity is valid.
Disability	368	366	0.803	0.137	Obtained value of 0.803 is > critical value of 0.137 and is highly significant. The question based on disability is valid.
Education	368	366	0.388	0.137	Obtained value of 0.388 is > critical value of 0.137 and is highly significant. The question based on education is valid.
Employment	368	366	0.714	0.137	Obtained value of 0.714 is > critical value of 0.137 and is highly significant. The question based on employment status is valid.
Municipality	368	366	0.740	0.137	Obtained value of 0.740 is > critical value of 0.137 and is highly significant. The question based on municipality is valid.

Table 4.15 shows the Pearson's Correlation coefficient of demographic information. The Pearson's Correlation, level of significance and the number of respondents of the following variables gender, age, ethnicity, disability, education, employment, and municipality. Table 4.16 Validation table summary.



The obtained value of 0.786 is > critical value of 0.137 and is highly significant. The question based on gender is valid. The obtained value of 0.664 is > critical value of 0.137 and is highly significant. The question based on age is valid. The obtained value of 0.370 is > critical value of 0.137 and is highly significant. The question based on ethnicity is valid. The obtained value of 0.803 is > critical value of 0.137 and is highly significant. The question based on disability is valid. The obtained value of 0.388 is > critical value of 0.137 and is highly significant. The question based on education is valid. Obtained value of 0.714 is > critical value of 0.137 and is highly significant. The question based on employment status is valid. The obtained value of 0.740 is > critical value of 0.137 and is highly significant. The question based on the municipality is valid.

**Table 4.18 Pearson's Correlation coefficient of Individual values towards ICT**

		Anxious	Ownership	Provision	ICT promotion	computer trainings	computer facilities usage	moving digitally	Attitude	Experience	total	
Anxious	Pearson Correlation	1	.690**	.649**	.605**	.561**	.558**	.572**	-.337**	.344**	.796**	
	Sig. (2-tailed)		<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	
	N	371	371	371	371	370	370	371	371	369	368	
Ownership	Pearson Correlation	.690**	1	.940**	.876**	.814**	.809**	.829**	-.560**	.038	.587**	
	Sig. (2-tailed)	<.001		<.001	<.001	<.001	<.001	<.001	<.001	.464	<.001	
	N	371	371	371	371	370	370	371	371	369	368	
Provision	Pearson Correlation	.649**	.940**	1	.932**	.866**	.861**	.883**	-.693**	.043	.555**	
	Sig. (2-tailed)	<.001	<.001		<.001	<.001	<.001	<.001	<.001	.407	<.001	
	N	371	371	371	371	370	370	371	371	369	368	
ICT promotion	Pearson Correlation	.605**	.876**	.932**	1	.929**	.923**	.947**	-.846**	.049	.512**	
	Sig. (2-tailed)	<.001	<.001	<.001		<.001	<.001	<.001	<.001	.347	<.001	
	N	371	371	371	371	370	370	371	371	369	368	
computer trainings	Pearson Correlation	.561**	.814**	.866**	.929**	1	.994**	.981**	-.839**	.055	.486**	
	Sig. (2-tailed)	<.001	<.001	<.001	<.001		.000	<.001	<.001	.288	<.001	
	N	370	370	370	370	370	370	370	370	369	368	
computer facilities usage	Pearson Correlation	.558**	.809**	.861**	.923**	.994**	1	.975**	-.833**	.056	.484**	
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	.000		<.001	<.001	.283	<.001	
	N	370	370	370	370	370	370	370	370	369	368	
moving digitally	Pearson Correlation	.572**	.829**	.883**	.947**	.981**	.975**	1	-.854**	.054	.491**	
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001	<.001	<.001		.303	<.001	
	N	371	371	371	371	370	370	371	371	369	368	
Attitude	Pearson Correlation	-.337**	-.560**	-.693**	-.846**	-.839**	-.833**	-.854**	1	-.050	-.280**	
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001	<.001	<.001		.334	<.001	
	N	371	371	371	371	370	370	371	371	369	368	
Experience	Pearson Correlation	.344**	.038	.043	.049	.055	.056	.054	-.050	1	.375**	
	Sig. (2-tailed)	<.001	.464	.407	.347	.288	.283	.303	.334		<.001	
	N	369	369	369	369	369	369	369	369	369	369	368
total	Pearson Correlation	.796**	.587**	.555**	.512**	.486**	.484**	.491**	-.280**	.375**	1	
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	
	N	368	368	368	368	368	368	368	368	368	368	368

\*\* . Correlation is significant at the 0.01 level (2-tailed).

**Table 4.19 Validation table summary of Individual values towards ICT**

Variable	N	DF	OV	CV	Comment
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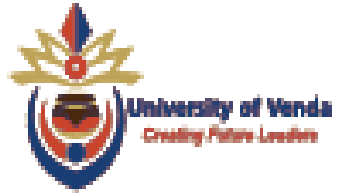
Anxious	368	366	0.786	0.137	The Obtained value of 0.786 is > critical value of 0.137 and is highly significant. The question based on anxious is valid.
Ownership	368	366	<b>0.587</b>	0.137	The Obtained value of <b>0.587</b> is > critical value of 0.137 and is highly significant. The question based on Ownership is valid.
Provision	368	366	0.555	0.137	The Obtained value of 0.555 is > critical value of 0.137 and is highly significant. The question based on provision is valid.
ICT promotion	368	366	0.512	0.137	The Obtained value of 0.512 is > critical value of 0.137 and is highly significant. The question based on ICT promotion is valid.
Computer training	368	366	0.486	0.137	The Obtained value of 0.486 is > critical value of 0.137 and is highly significant. The question based on Computer training is valid.
Computer facility usage	368	366	0.484	0.137	The Obtained value of 0.484 is > critical value of 0.137 and is highly significant. The question based on Computer facility usage is valid.
Moving digitally	368	366	0.491	0.137	The Obtained value of 0.491 is > critical value of 0.137 and is highly significant. The question



					based on Moving digitally is valid.
Attitude	368	366	0.280	0.137	The Obtained value of 0.280 is > critical value of 0.137 and is highly significant. The question based on attitude is valid.
Experience	368	366	0.375	0.137	The Obtained value of 0.375 is > critical value of 0.137 and is highly significant. The question based on experience is valid.

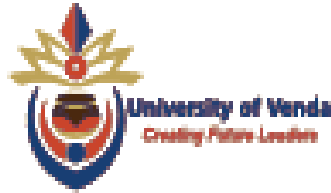
Table 4.18 shows the Pearson's Correlation coefficient of individual values towards ICT. Pearson's Correlation, level of significance and the number of respondents of the following variables anxious, ownership, provision, ICT promotion, computer training, computer facility usage, moving digitally, attitude and experience. Table 4.19 Validation table summary.

The Obtained value of 0.786 is > critical value of 0.137 and is highly significant. The question based on anxiety is valid. The obtained value of 0.587 is > critical value of 0.137 and is highly significant. The question based on ownership is valid. The obtained value of 0.555 is > the critical value of 0.137 and is highly significant. The question based on the provision is valid. The obtained value of 0.512 is > critical value of 0.137 and is highly significant. The question based on ICT promotion is valid. The obtained value of 0.486 is > critical value of 0.137 and is highly significant. The question based on computer training is valid. The obtained value of 0.484 is > critical value of 0.137 and is highly significant. The question based on computer facility usage is valid. The obtained value of 0.491 is > critical value of 0.137 and is highly significant. The question based on moving digitally is valid. The obtained value of 0.280 is > critical value of 0.137 and is highly significant. The question based on attitude is valid. The obtained value of 0.375 is > the critical value of 0.137 and is highly significant. The question based on experience is valid.





**Table 4.20 Pearson's Correlation coefficient of ICT capabilities and usage.**



		Basic operations	ICT usability	Improve individual's standard of living	ICT policies	Freedom	Empowerment	Individual choice	ICT policy and regulations	Difference	Price value	ICT skills	Access to ICT	total
Basic operations	Pearson Correlation	1	.786**	.839**	.605**	1.000**	.367**	.924**	.024	.601**	.486**	.868**	.362**	.934**
	Sig. (2-tailed)		<.001	<.001	<.001	.000	<.001	<.001	.650	<.001	<.001	<.001	<.001	<.001
	N	369	369	369	369	369	369	369	369	369	369	369	369	368
ICT usability	Pearson Correlation	.786**	1	.942**	.625**	.773**	.272**	.731**	-.043	.448**	.408**	.666**	.141**	.806**
	Sig. (2-tailed)	<.001		<.001	<.001	<.001	<.001	<.001	.407	<.001	<.001	<.001	.007	<.001
	N	369	371	371	371	371	371	371	371	371	371	371	371	368
Improve individual's standard of living	Pearson Correlation	.839**	.942**	1	.641**	.826**	.291**	.783**	.004	.479**	.434**	.712**	.130*	.856**
	Sig. (2-tailed)	<.001	<.001		<.001	<.001	<.001	<.001	.934	<.001	<.001	<.001	.013	<.001
	N	369	371	371	371	371	371	371	371	371	371	371	371	368
ICT policies	Pearson Correlation	.605**	.625**	.641**	1	.599**	.016	.485**	-.195**	.182**	.425**	.498**	.026	.631**
	Sig. (2-tailed)	<.001	<.001	<.001		<.001	.754	<.001	<.001	<.001	<.001	<.001	.624	<.001
	N	369	371	371	371	371	371	371	371	371	371	371	371	368
Freedom	Pearson Correlation	1.000**	.773**	.826**	.599**	1	.362**	.922**	.025	.602**	.481**	.868**	.358**	.934**
	Sig. (2-tailed)	.000	<.001	<.001	<.001		<.001	<.001	.633	<.001	<.001	<.001	<.001	<.001
	N	369	371	371	371	371	371	371	371	371	371	371	371	368
Empowerment	Pearson Correlation	.367**	.272**	.291**	.016	.362**	1	.477**	.138**	.923**	.470**	.193**	.172**	.205**
	Sig. (2-tailed)	<.001	<.001	<.001	.754	<.001		<.001	.008	<.001	<.001	<.001	<.001	<.001
	N	369	371	371	371	371	371	371	371	371	371	371	371	368
Individual choice	Pearson Correlation	.924**	.731**	.783**	.485**	.922**	.477**	1	.197**	.664**	.474**	.770**	.294**	.859**
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001	<.001		<.001	<.001	<.001	<.001	<.001	<.001
	N	369	371	371	371	371	371	371	371	371	371	371	371	368
ICT policy and regulations	Pearson Correlation	.024	-.043	.004	-.195**	.025	.138**	.197**	1	.103*	-.004	-.072	-.056	.140**
	Sig. (2-tailed)	.650	.407	.934	<.001	.633	.008	<.001		.047	.938	.169	.283	.007
	N	369	371	371	371	371	371	371	371	371	371	371	371	368
Difference	Pearson Correlation	.601**	.448**	.479**	.182**	.602**	.923**	.664**	.103*	1	.545**	.413**	.262**	.443**
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001	<.001	<.001	.047		<.001	<.001	<.001	<.001
	N	369	371	371	371	371	371	371	371	371	371	371	371	368
Price value	Pearson Correlation	.486**	.408**	.434**	.425**	.481**	.470**	.474**	-.004	.545**	1	.436**	-.079	.354**
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001	<.001	<.001	.938	<.001		<.001	.129	<.001
	N	369	371	371	371	371	371	371	371	371	371	371	371	368
ICT skills	Pearson Correlation	.868**	.666**	.712**	.498**	.868**	.193**	.770**	-.072	.413**	.436**	1	.275**	.795**
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001	<.001	<.001	.169	<.001	<.001		<.001	<.001
	N	369	371	371	371	371	371	371	371	371	371	371	371	368
Access to ICT	Pearson Correlation	.362**	.141**	.130*	.026	.358**	.172**	.294**	-.056	.262**	-.079	.275**	1	.333**
	Sig. (2-tailed)	<.001	.007	.013	.624	<.001	<.001	<.001	.283	<.001	.129	<.001		<.001
	N	369	371	371	371	371	371	371	371	371	371	371	371	368
total	Pearson Correlation	.934**	.806**	.856**	.631**	.934**	.205**	.859**	.140**	.443**	.354**	.795**	.333**	1
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001	<.001	<.001	.007	<.001	<.001	<.001	<.001	
	N	368	368	368	368	368	368	368	368	368	368	368	368	368

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).



**Table 4.21 Validation table summary of ICT capabilities and usage.**

Variable	N	DF	OV	CV	Comment
Basic operations	368	366	0.934	0.137	The Obtained value of 0.934 is > critical value of 0.137 and is highly significant. The question based on Basic operations is valid.
ICT usability	368	366	0.806	0.137	The Obtained value of 0.806 is > critical value of 0.137 and is highly significant. The question based on ICT usability is valid.
Standard of living	368	366	0.856	0.137	The Obtained value of 0.856 is > critical value of 0.137 and is highly significant. The question based on Standard of living is valid.
ICT provision	368	366	0.631	0.137	The Obtained value of 0.631 is > critical value of 0.137 and is highly significant. The question based on ICT provision is valid.
Freedom	368	366	0.934	0.137	The Obtained value of 0.934 is > critical value of 0.137 and is highly significant. The question based on Freedom is valid.
Empowerment	368	366	0.631	0.137	The Obtained value of 0.631 is > critical value of 0.137 and is highly significant. The question based on empowerment is valid.
Choices	368	366	0.859	0.137	The Obtained value of 0.859 is > critical value of 0.137 and is

					highly significant. The question based on Choices is valid.
ICT policy and regulation making	368	366	0.140	0.137	The Obtained value of 0.140 is > critical value of 0.137 and is highly significant. The question based on ICT policy and regulation making is valid.
Difference	368	366	0.443	0.137	The Obtained value of 0.443 is > critical value of 0.137 and is highly significant. The question based on difference is valid.
Price value	368	366	0.354	0.137	The Obtained value of 0.354 is > critical value of 0.137 and is highly significant. The question based on Price value is valid.
ICT skills	368	366	0.795	0.137	The Obtained value of 0.795 is > critical value of 0.137 and is highly significant. The question based on ICT skills is valid.
Access	368	366	0.333	0.137	The Obtained value of 0.333 is > critical value of 0.137 and is highly significant. The question based on access is valid.

Table 4.20 shows the Pearson's Correlation coefficient of ICT capabilities and usage. The Pearson's Correlation, level of significance and the number of respondents of the following variables basic operations, ICT usability, standard of living, ICT provision, freedom, empowerment, choices, ICT policy and regulation making, individual difference, price value, ICT skills and access to ICT. Table 4.21 Validation table summary.

#### Phase two.

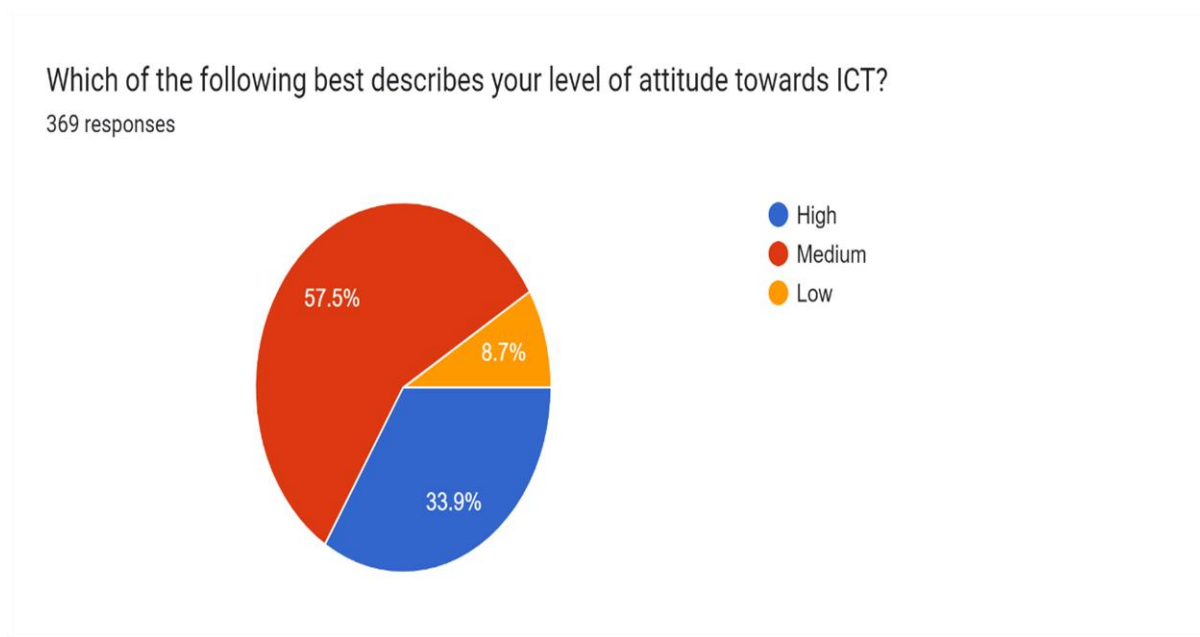


**4.3. Section B presents individual values towards ICT.**

**Table 4.2.1 frequency and percentage table of individual values towards ICT.**

Question	No		Yes	
	F	%	F	%
Do you feel anxious when you think of using ICT?	219	59.2	151	40.8
Do you have a computer/laptop?	151	40.8	219	59.2
Have you ever listened/read about the provision of ICT to the local municipalities?	140	38.1	227	61.9
Does the government initiatives support and promote the use of ICT in Vhembe district?	128	34.6	242	65.4
Are you provided with computer trainings in your area?	116	31.4	254	68.6
Do you use computer facilities for the community such as computer laboratories?	118	31.9	251	67.8
Are businesses in your municipality moving digitally?	117	31.7	252	68.3

Table 4.2.1 presents the questions based on individual values towards ICT with their frequencies and percentages.



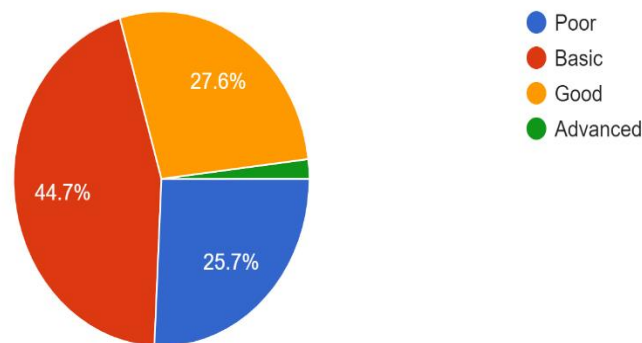


### Figure 4.1 Attitude towards ICT

Figure 4.1 shows that 57.5% of the respondents from the Vhembe District had a moderate attitude towards ICT, while 33.9% of respondent's high attitude and 8.7% of respondents have low attitude towards using ICT services.

How good is your experience when using ICT?

369 responses



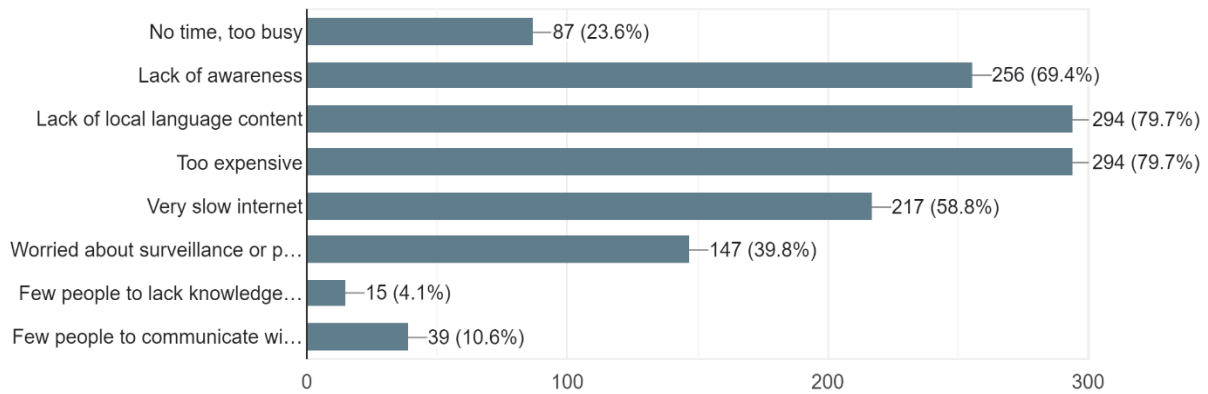
### Figure 4.2 Experience when using ICT

Figure 4.2 presents the user experience with ICT. 44.7% have a basic knowledge of how to use ICT, 27.6% are good with ICT, 25.7% poor experience and 1.9% are advanced ICT users from the Vhembe district municipality. This finding concurs with the finding of a similar study done by Khene and Masiero (2022), which established that people who use ICT services the most understand what they are doing.



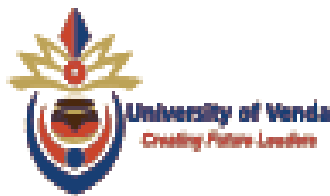
### What limits people from using ICTs in rural South Africa?

369 responses



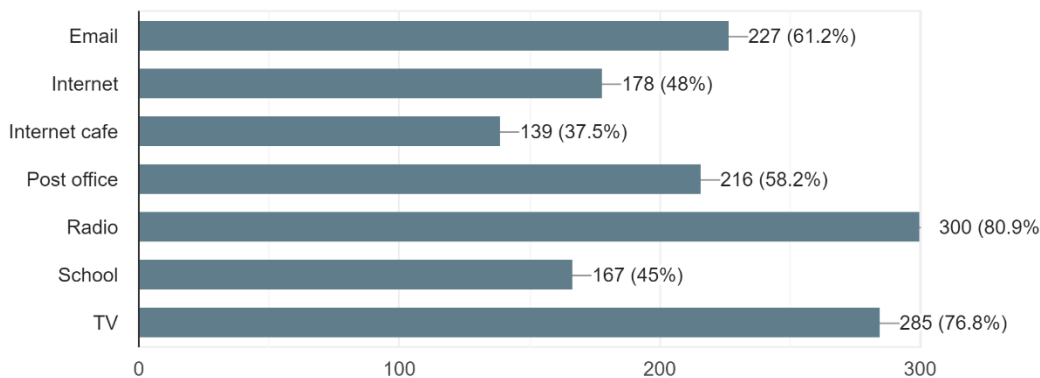
#### Figure 4.3 Hinderling factors to use ICT

The factors that limit people from using ICT in marginalized communities within the Vhembe district municipality are no time and too busy (23.6%), followed by lack of awareness and exposure to ICT (69.4%), lack of local language content (79.7%), too expensive (79.7%), very slow internet connectivity (58.8%), worried about the surveillance or protection of personal information (39.8%), lack of knowledge about ICT (4.1%) and communication using ICTs (10.6%).



Which tools play a major role in increasing the empowerment and voice of your community in decisions that affect their lives and in holding government accountable?

371 responses



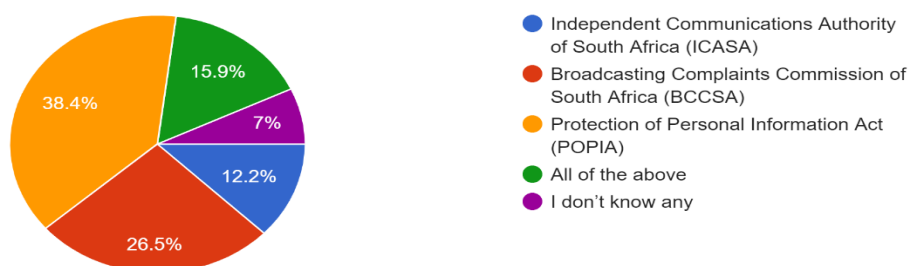
**Figure 4.4 ICT empowerment tools**

The tools that play a major role in increasing the empowerment and voice of your community in decisions that affect their lives and in holding government accountable. People in Vhembe district municipality use email (61.2%), Internet devices (48%), Internet café (37.5%), Post office (58.2%), Radio (80.9%), School (45%) and TV (76.8%).

**Section B presents results for ICT capabilities.**

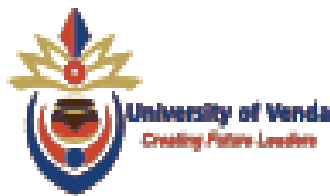
Which of the following ICT protection bodies are you aware of?

370 responses

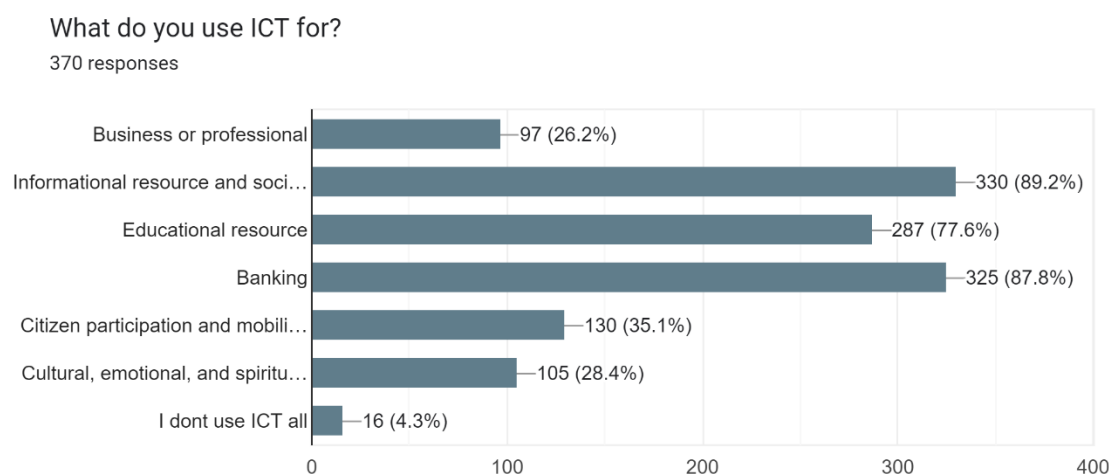


**Figure 4.5 Awareness of ICT protection bodies**

Figure 4.5 presents ICT protection bodies that individuals from Vhembe district are aware including the Independent Communications Authority of South Africa (ICASA) (12.2%), the Broadcasting Complaints Commission of South Africa (BCCSA) (26.5%), and Protection of



Personal Information Act (POPIA) (38.4%), all the above (15.9%) and I do not know any (7%). This finding agrees with the finding of a similar study done by Khader, Karam and Fares (2021), which established that the common ICT protection body known by majority of people is POPIA.



#### Figure 4.6 uses of ICT

Figure 4.6 presents the primary uses of ICT: Business or professional (26.2%), informational and social resources (89.2%), educational resources (77.6%), banking (87.8%), citizen participation and mobilisation (35.1%), and cultural, emotional and spiritual needs (28.4%) and lastly, I do not use ICT at all (4.3%).

#### Chapter Summary

This chapter focuses on analyzing and interpreting the findings on the impacts of using ICT for capacity building by the disadvantaged people in Vhembe district municipality, Limpopo province. Table 4.1 provides a summary of the demographic factors (namely gender, age group, ethnicity, disability, level of education, employment status and municipality), frequency and percentage of the respondents from the Vhembe district municipality who participated in this study. The 369 Vhembe District Municipality respondents. Table 4.1 provides a summary of the demographic factors (namely gender, age group, ethnicity, disability, level of education, employment status and municipality), frequency and percentage of the respondents from the



Vhembe district municipality who participated in this study. The 369 Vhembe District Municipality respondents, who participated in this research, were predominantly females (58.3%) between the age of 30 and 39(38.3%) were Blacks (94.1%). Most participants for this study were not challenged (60.3%), which stressed the notion that the challenged must be encouraged to participate in ICT activities. Respondents with National Diploma (27.5%) were part time employed residing in the Thulamela Municipality (54.7%).

This study used Cronbach's Alpha. The Cronbach's Alpha output of 0.863 for all the 38 variables in Table 4.2 shows that the tool is highly reliable as it is greater than 0.7 variance which is acceptable for a new instrument. This proves that the question on each construct was consistent, as indicated by the total number of items statistics. Pearson's Correlation coefficient was used to test how valid the questions in the questionnaire were. This study consists of eight Hypothesis which were tested using Pearsons Chi Square Tests, Phi and Cramer's Value Test for symmetric measures, Group statistics and independent Sample Tests. The accepted Hypothesis are as follows: H1 0: Access to ICT has influence on use of ICT in marginalized communities. H2 0: ICT Skills have an influence on use of ICT in marginalized communities. H3 0: Price Value has influence on use of ICT in marginalized communities. H4 0: Individual Differences have an influence on use of ICT in marginalized communities. H5 0: ICT Policy and Regulations have an influence on use of ICT in marginalized communities. H6 0: Individual choice has influence on use of ICT in marginalized communities. H7 0: Use of ICT in Marginalized Communities (U-ICT-MC) has influence on Enhanced Information Capabilities (EIC). H8 0: Enhanced Information Capabilities (EIC) have an influence on Enhanced Human Capabilities (EHC).



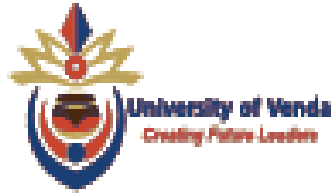
## **CHAPTER 5: CONCLUSION AND RECOMMENDATIONS**

### **5.1 Introduction**

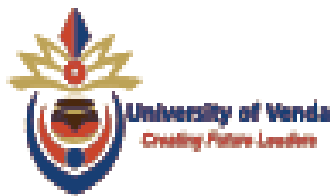
The main aim of the study was to assess the factors preventing marginalized communities from using ICT service for growth and development. The finding from this study can help the policy makers and regulatory bodies involved in projects for digital inclusive development. The proposed Sen's Capability theory offers a clear view of that scholars and policy makers can use to empower ICT usage in disadvantaged groups of people in Limpopo Province. It has been difficult to empower disadvantaged individuals and convince them to use, embrace, and recommend ICT services to others. The government and stakeholders working to end poverty and inequalities must understand what factors help or disrupt the process of utilising ICT. ICT capacity building has been part of the millennium development goals in South Africa. However, the findings from this study show that the rate at which adoption and use of ICT is growing at a slower rate, in most rural communities. The slower rate of capacity building has been caused by various factors pertaining the use of ICT in marginalized communities of South Africa such as the access to ICT, ICT skills, price value, individual differences, ICT policy and regulations and individual choices. All these have been identified as the contributing factors affecting ICT capacity building using ICT services in marginalized communities of South Africa. The government and business stakeholders are investing in the development of ICT projects with the hope of improving the usage and awareness of ICT services.

### **5.2 Overview of the findings**

The findings in this study attempted to answer questions based on factors affecting marginalized people from using ICT services for development in Vhembe district of Limpopo province in South Africa. The discussions below are focused on how residents view the importance of ICT services in their daily lives. The analysis above has shown that ICTs can significantly enhance the human and social capabilities of the marginalized people which include people taken for granted because they are living with disability, their employment status, they belong to a certain ethnic group, level of education, age group, gender based norms and belonging to an underrated municipality thus empowering them at the individual and collective level in Vhembe District municipality.



At the core of the individual values towards ICT stands the notion that ICTs can enhance people's control over their own lives through the ICT devices that they own. The result from analysis shows the existing hype around the potential benefits of ICTs, the high expectations of poor communities cannot be met. ICT services are too expensive to acquire them. The user's experience from Vhembe residents shows that ICTs are only able to address certain aspects of the development, challenges facing marginalized groups of people and that they cannot change the existing structural, social, political, and economic inequality. The effect of ICT training programmes from the government seems to psychologically empower marginalized groups of people, whereby the gained ICT skills give them a sense of achievement and confidence to use ICT services. This study focuses more on human development of people, rather than placing technology at the center of focus for ICT development programmes to enhance marginalized people. The choice of using the capability approach as a suitable model for the evaluation of ICT capacity building resides on the ability of ICT services to improve the daily livelihoods of people, such as residents in Vhembe district. The capacity-building training enhances the informational capacity of indigenous peoples not only to make meaningful use of ICTs, but also to maintain and carry out basic ICT operations such as using technology for banking, searching for educational resources, citizens' participation and mobilization, informational resource and for business purposes. These findings for the study clearly illustrate that ICTs can play an important role in strengthening the human and social capabilities of marginalized groups. The findings show that people encountered problems of being able to relate to the new media due to the lack of local content in their own language. The men in Vhembe district communities are uninterested in the technology, as they felt that the ICT services cannot provide them with any concrete information or services they could use in their daily lives. The data showed that marginalized people are finding it hard to use ICT services for their daily needs because they believe that they lack awareness of the impact that ICT services have on them and exposure to ICT services, and the marginalized people find ICT services too expensive and thus they have to choose between bread and ICT for their survival and the minority that can afford are constrained by geographic location making it hard for network signals to reach their residential areas causing the internet connectivity to be very slow.



### **5.3 Recommendations**

The success of ICT building capacity in marginalized people, the gap between those who have internet connectivity and those who don't need to be bridged. A few recommendations that arose from the study include the need for empowering the marginalised people by involving them in the choice of which ICTs would benefit their lives, providing basic trainings to marginalised people on how to use ICTs before project implementation is done, resource centres must be functional with both skilled human resources and technological capacities to train communities about ICTs, marginalised groups must be provided with the information and communication technologies that are important and can be shared to sustain the communities. The network service providers need to ensure that the rural communities have access to communication networks to reduce the problem of misinformation and misplaced facts that are important for empowering the marginalised. The South African government must set up competent support systems to supervise every aspect of the National Information and Communication Technology Policy by driving network penetration for marginalised groups.

### **5.4 Future research**

This research focuses on the capacity building of marginalized groups of people using ICT in Thulamela and Makhado municipality in Vhembe district. The social, political, economic, and cultural conditions are not the same across all the provinces in South Africa, generalizing the results found in Vhembe district municipality must be carefully addressed. Furthermore, factors and variables found in Sens capability and conviviality approach have not all thoroughly been investigated and thus the research gap for the future.

### **5.5 Limitation**

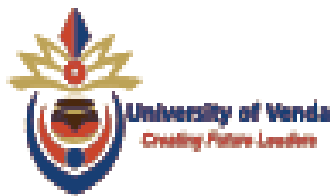
The primary limitation of this research study is that the respondents were from two local municipalities of Vhembe district, which are Thulamela and Makhado municipality and



therefore, it is a challenge to generalize the findings to other municipalities in all provinces. The inclusion of other provinces would have made the findings more valid with regards to ICT building capacity in marginalized groups. However, due to lack of time, other provinces could not be included for the current research study. The challenge was to look for willing and committed participants as participation was entirely voluntary. The validity and reliability of the survey instrument through which data was collected. The study did not include data collection through the interviews but only questionnaires including closed-ended questions. The participants may decide not to participate in the survey for reasons such as lack of interest, motivation, time, some questions may not be relevant to the respondent's situation, the respondent's lack of understanding regarding the question asked, options not suitable to represent the participant's true opinions and completing the question may be of discomfort to the respondents. Incomplete data is a result of unanswered questions that can have an impact on the reliability of the results. The survey of this study had some of the responses with missing responses.

## **5.6 Summary**

The chapter outlined the discussion of the introduction and findings. It laid out how the use of ICT affects marginalized people. The chapter also outlined recommendations of the study and suggestions for the future research and the limitations of the study.



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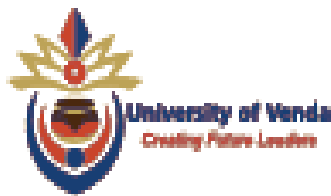
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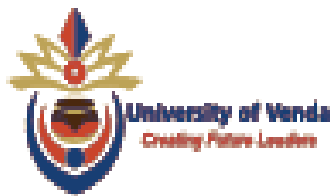
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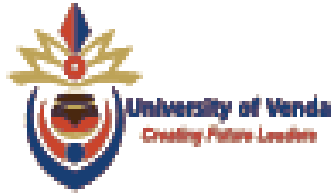
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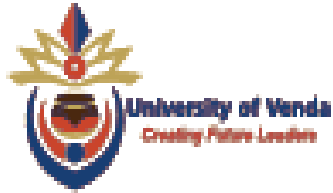
### ANNEXTURE A: Estimated budget for the research.

The table below represent the proposed budget of the study with the estimated costs

<b>Item</b>	<b>Description</b>	<b>Amount</b>	<b>Motivation</b>
<b>Assistance</b>			
Research assistant	1 research assistant (@R 150 per day for 20 days)	R3 000.00	To help with data collection
Data analyst	Data analysis 250 questionnaires @R20 each	R5 000.00	To analyse the data collected
<b>Proof reading and Editing</b>	Proof reading research proposal @R25/page for 40 pages	R1 000	English language editing and proof reading
	Proof reading for final research @R25/page for 150 pages	R3 750	
<b>TOTAL</b>		<b>R12 750.00</b>	
<b>Consumables</b>			
<b>Stationery</b>	Highlighter x4 @R30.00, Pen Ballpoint X4 @R30 per pack, Clutch Pencil @ R25 Laptop Bag @R420, Ruler @R35, Staples X3 @R14/pk. Notebook x2 @R30 Stapler @R160, USB @ R 100.00,	R1 022.00	Stationary to assist during the entire research study
<b>Equipment</b>			



<b>TOTAL</b>			
		<b>R1 022.00</b>	
<b>Travelling Expenses</b>	From UNIVEN to Makhado @ R 3.61/km X134km (to and from) x 16trips	<b>R7 739.84</b>	Travelling to the study area for distribution and collection of questionnaires
<b>Subsistence</b> Meals and refreshments	@ 100 per day for 20 days, 2 people	<b>R4 000.00</b>	Subsistence's during data collections
<b>Printing</b>	Printing of proposal @R4 X 40 pages. Printing of questionnaire 400 Copies, 4 pages each @R4/page Printing of final dissertation @R4 X 150 pages, 5 copies	R 160 .00  R6 400.00  R3 000.00	Printing of research proposal and complete dissertation
<b>TOTAL</b>		<b>R8 706</b>	
<b>Binding</b>	Spiral Binding @R 70 X 5 Copies Book binding (Final research) @R 380 X 5 copies	R 350  R1 900	Spiral and book binding of the final research
<b>TOTAL</b>		<b>R2 250</b>	
<b>GRAND TOTAL</b>		<b>R 36 461,84</b>	



## ANNEXTURE B: PROPOSED WORK PLAN FOR THE STUDY

ACTIVITIES	DATES																																																											
	2020												2021												2022												2023																							
Month	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D															
Consultation with the supervisor																																																												
Writing proposal																																																												
Submission of proposal																																																												
Proposal presentation and correction																																																												
Literature review and research methodology writing and submission																																																												
Data Collection																																																												
Data analysis																																																												
Interpretation and Result																																																												
Submission of the Study																																																												
Correction																																																												
Final Submission																																																												



## **ANNEXTURE C: CONSENT LETTER.**

### **LETTER REQUESTING CONSENT TO PARTICIPATE IN RESEARCH**

Dear Participant,

I would like to invite you to participate in the research study entitled “Harnessing ICT’s capacity building for marginalized communities in South Africa”. I am currently enrolled in the Master of Commerce in Business Information Systems programme at the University of Venda and I am in the process of writing my dissertation.

The enclosed questionnaire has been designed to collect information on the factors that influence marginalized communities from adopting Information and Communication Technology to improve their quality of lives. Your participation in this research is completely voluntary and you may withdraw from the research at any time if you wish to do so. Your responses will remain confidential and anonymous. Data collected from this questionnaire will contribute towards the final research report.

If you agree to participate, please complete the questionnaire and answer the research question. The questionnaire will take approximately 20 minutes to complete. Thank you for your assistance.

Yours Sincerely,

---

M. A. W Nemalamangwa



## **ANNEXTURE D: SURVEY QUESTIONNAIRE.**

**Dear Sir /Madam,**

### **Invitation to participate in academic research study**

My name is Nemalamangwa Aluwani Mulanga Wisdom (11633909), I am doing a Master of Commerce in Business Information Systems Degree in the School of Management Sciences at the University of Venda.

I am conducting a research project with the aim to design a framework for the impacts of ICT capacity building in marginalized communities of South Africa. The research will review the concept of Information and Communication Technology (ICT) to enhance the standard of living for disadvantaged groups of people by using Sens capability Approach.

To this end, I humbly request you to complete a short survey that should take not more than 20 minutes. The survey questionnaire consists of three sections.

#### **Please Note:**

Your Personal details such as Names, ID number are not required

All the questions are to aid in conducting research.

Understand that your participation is valuable to the success of this study; but not compulsory therefore you can withdraw at any time.

Should you have any concern regarding this survey, please contact:

Researcher: Mr Aluwani Nemalamangwa >>cell +27 783165052 Email:  
11633909@mvula.univen.ac.za

supervisor Doctor W. Munyoka>>Tel: +27 15 962 8242 Email: willard.munyoka@univen.ac.za

Co-Supervisor: Prof. A Kadyamatimba>>Tel: +27 15 962 8532 Email: armstrong.kadyamatimba@univen.ac.za

### **Section A: Demographic information**

For each item below, please show your best response by making a clear cross(X) on the circle provided next to your selected response.



1. What is your gender?

Male       female

2. What is your age group?

15-20       21-29       30-39       40 and above

3. Which ethnic group do you fall under?

African/Black     Asian/Indian     coloured     white

4. Are you disable (challenged)?

Yes       No

5. What is your highest level of education?

Non formal education     Primary education     Undergraduate degree

Honours       Masters       PhD

6. Which option best describes your current employment status?

Unemployed     Part time employed     Full time employed

7. Which municipality do you reside on within the Vhembe district municipality?

Thulamela     Makhado

**Section B: Individual values towards ICT**

**Individual view on the importance of ICT to individuals**

Please put a cross(X) on the correct box of your view point on ICT values where: Y= yes and N= no

No	Respond to all statements	Y	N
8.	Do you have a computer/laptop?		
9.	Have you ever read/listen the president addressing ICT policy issues?		



10.	Can the IT industry be relied upon to create sustainable development opportunities?		
11.	Have you ever listened/read about the provision of ICT to the local municipalities?		
12.	Are you provided with computer trainings in your area?		
13.	Do you use computer facilities for the community such as computer laboratories?		
14.	Do you have internet access at your home/resident?		
15.	Can you afford the prices of ICT devices and services?		

16. Are there wireless networks, such as satellite and microwave links available?

- Yes       No       I don't know

17. How often do you access the internet?

- Hourly       Daily       weekly       monthly

18. What is your purposes of using ICT?

- Business or professional use       Informational resource       Services and safety  
 Educational resource       Cultural, emotional, and spiritual needs  
 Banking       Citizen participation and mobilization

19. Which tools play a major role in increasing the empowerment and voice of your community in decisions that affect their lives and in holding government accountable?

- Radio       Mobile phone       Telephone landline       TV  
 Internet       Email       Newspaper       Fax  
 Internet cafe       Call centre       School       Post office  
 Post office       Word of mouth       Community meetings

20. Which company is your mobile phone service provider? (For mobile phone owners. Multiple answers accepted).

- MTN       Vodacom       Cell C       Telkom

21. Which of the following ICT protection bodies are you aware of?

- Independent Communications Authority of South Africa (ICASA)



- Competition Commission
- Broadcasting Complaints Commission of South Africa (BCCSA)
- I don't know any

22. Why are ICT policies are not implemented?

- Lack of ICT infrastructure.
- Lack of proper ICT policy implementation.
- Lack of financial resources.
- Social challenges
- Lack of environmental scanning to ensure that projects satisfy user requirements and add value to citizens.
- Low level of education resulting in lack of skills to perform key operations.

23. Which of the following best describes your level of attitude towards ICT?

- High       Medium       low

**Individual view on ICT**

Please put a cross(X) on the correct box of your view point on ICT usage where: SA= Strongly agree, A= Agree, N=Neutral, D= Disagree, and S.D= Strongly Disagree

No	Respond to all statements	SA	A	N	D	SD
1	I have a broader understanding of using Information and Communication Technology (ICT) for basic operations such as ATM banks, placing orders in restaurants and applications for transport.					
2	ICT helps to improve individual's standard of living through shared information from social platforms.					
3	ICT devices are easily accessible					
4	There are more people who uses ICT than those who don't					
5	I enjoy the functionalities of ICT devices and its applications					
6	ICT improves individual social life					



7	I feel comfortable using ICT devices					
8	The adoption of ICT will be beneficial to the community					
9	There is enough ICT infrastructure provided in my municipality to adopt ICT.					
10	Training should be considered before enforcing ICT infrastructure in marginalized communities of Vhembe.					
11	Government must enforce the use of ICT applications to their stakeholders					
12	There are more residents who have access to ICT devices and internet than those who don't					

### Section C: ICT Capabilities

24. What is your biggest concern with ICT in development?

- Retaining skilled staff     Resistance to change     Information security / data privacy

25. Which device do you use to access the Internet?

26.  Mobile phone     Telephone landline     TV

27. what limits people from using ICTs in rural South Africa?

- No interesting content     Very slow internet  
 Too expensive     Lack of local language content  
 No time, too busy     Affordability of ICT  
 Lack of awareness     Worried about surveillance or privacy invasion  
 Lack of skills     Few people to communicate with via the internet  
 Lack of interest     Lack of time

28. Which tools do you use to receive or access government information? (Birth certificates, health alerts, financial services)

- Radio     Mobile phone     Telephone landline     TV  
 Internet     Email     Newspaper     Word of mouth  
 School     Physical visit to office     Post office



### Usage of ICT resources

Please put a cross(X) on the correct box of your viewpoint on ICT infrastructure where: (1) = S.A-Strongly Agree, (2) = A-Agree, (3) = N-Neutral, (4) = D-Disagree, and (5) = S.D-Strongly Disagree,

<u>No</u>	<u>Respond to all question</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
<u>1</u>	ICT usage helps save time.					
<u>2</u>	The usage of ICT infrastructure is costly to the government.					
<u>3</u>	There are resource available to facilitate the usage of ICTs in Vhembe District municipality.					
<u>4</u>	Many citizens have access to and uses ICT services than those who don't.					
<u>5</u>	ICT usage has a positive impact on the citizens behavior towards ICTs					
<u>6</u>	ICT services has provided an ease of access of information to all citizens					

### **Benefits of using ICT**

Please put a cross(X) on the correct box of your view point on ICT applications where: SA= strongly agree, A= Agree, N=Neutral, D= Disagree, and S.D= Strongly Disagree

<b>No</b>	<b>Respond to all statements</b>	<b>SA</b>	<b>A</b>	<b>N</b>	<b>DA</b>	<b>SD</b>
<b>1</b>	<b>I believe that using information and Communication Technology will:</b>					
1.1	Will prepare me for my professional work.					
1.2	Will make me more competitive to the job market.					
1.3	Will make me access my files at any time of the day.					
<b>2</b>	<b>I believe that ICT devices are easy to:</b>					
2.1	Use applications via cloud services.					
2.2	Understand operations within the internet.					
2.3	provide help by troubleshooting issues with the cloud.					
<b>3</b>	<b>I believe that the speed of ICT platforms are:</b>					

3.1	Quicker to process data than the traditional ways of processing data.					
3.2	More sufficient for backup and storage.					
3.3	Efficient to use.					
<b>4</b>	<b>I believe that the cost of Information and Communication Technology infrastructure is:</b>					
4.1	Expensive to deploy.					
4.2	Less when buying in bulk than buying individually.					
4.3	Decreases with volume, the less cloud space you use the less you pay.					
<b>5</b>	<b>I believe that Information and Communication Technology provider will:</b>					
5.1	Encrypt my personal data and information.					
5.2	Prevent unauthorized access to my files.					
5.3	Protect my data from theft.					
<b>6</b>	<b>I believe that ICT will</b>					
6.1	Increase my confidence in becoming aware of my competencies					
6.2	Increase communication opportunities.					
6.3	Increase my ability to generate income because of using ICTs programmes and applications.					
6.4	Increased choice of deciding the kind of life one wants to live.					
6.5	Opportunity to participate in governance and decision making.					
<b>7</b>	<b>In which of the following sectors can ICT play a key role?</b>					
7.1	In Health, when scanning diseases.					
7.2	In Agriculture by using drone technology for farming.					
7.3	ICT is used for point of sales and advertisement in Businesses.					
7.4	Education, when using E-learning for students.					
7.5	Government information services.					
7.6	Entertainment.					
7.7	Environment, weather forecasting.					

**Thank you for participating in this study.**





**ANNEXTURE E: Research Ethics letter.**



ETHICS APPROVAL CERTIFICATE

RESEARCH AND INNOVATION  
OFFICE OF THE DIRECTOR

NAME OF RESEARCHER/INVESTIGATOR:  
**Mr MAW Nemalamangwa**

STUDENT NO:  
**11633909**

PROJECT TITLE: **Harnessing ICT capacity building for marginalized communities in Vhembe district municipality of Limpopo province, South Africa.**

ETHICAL CLEARANCE NO: **FMCL/22/BIS/02/3005**

SUPERVISORS/ CO-RESEARCHERS/ CO-INVESTIGATORS

NAME	INSTITUTION & DEPARTMENT	ROLE
Dr W Munyoka	University of Venda (Business Information Systems)	Supervisor
Prof A Kodyamalimba	University of Venda (Business Information Systems)	Co - Supervisor
Mr MAW Nemalamangwa	University of Venda	Investigator – Student

Type: **Masters Research**

Risk: **Minimal risk to humans, animals or environment (Category 2)**

Approval Period: **May 2022 – May 2024**

The Research Ethics Social Sciences Committee (RESSC) hereby approves your project as indicated above.

**General Conditions**

While this ethics approval is subject to all declarations, undertakings and agreements incorporated and signed in the application form, please note the following:

- The project leader (principal investigator) must report to the prescribed format to the REC:
  - Annually (or as otherwise requested) on the progress of the project, and upon completion of the project.
  - Within 48hrs in case of any adverse event (or any matter that interrupts sound ethical principles) during the course of the project.
  - Annually a number of projects may be randomly selected for an external audit.
- The approval applies strictly to the protocol as included in the application form. Should any changes to the protocol be deemed necessary during the course of the project, the project leader must apply for approval of these changes to the REC. Should there be deviations from the project protocol without the necessary approval of such changes, the ethics approval is immediately and automatically forfeited.
- The date of approval indicates the first date that the project may be started. Would the project have to continue after the expiry date, a new application must be made to the REC and new approval received before or on the expiry date.
- In the interest of ethical responsibility, the REC retains the right to:
  - Request access to any information or data at any time during the course or after completion of the project.
  - To ask further questions; seek additional information; require further modification or monitor the conduct of your research or the informed consent process.
  - Withdraw or postpone approval if:
  - Any unethical principles or practices of the project are revealed or suspected.
  - It becomes apparent that any relevant information was withheld from the REC or that information has been false or misrepresented.
  - The required annual report and reporting of adverse events was not done timely and accurately.
  - New institutional rules, national legislation or international conventions deem it necessary.

ISSUED BY:

UNIVERSITY OF VENDA, RESEARCH ETHICS COMMITTEE

Date Considered: **May 2022**

Name of the RESSC Chairperson of the Committee: **Prof TS Mashau**

Signature 

