# Investigating the socio-economic impact of deploying affordable fibre-based internet in disadvantaged middle-LSM communities in Gauteng

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# DECLARATION

I hereby declare that the document submitted herewith to the North-West University in partial fulfilment of the requirements for the Master of Business Administration (MBA) degree is my own original work. It has been text-edited in accordance with professional communication standards and has not been previously submitted to any other institution for evaluation purposes.

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## ABSTRACT

This study uses a quantitative approach via an online questionnaire to examine the socioeconomic effects of implementing inexpensive uncapped fibre Internet in lower- to middle-income communities in the West Rand region of Gauteng. ICT systems have grown over the past decades, and the broad reach of the Internet has transformed how people connect and perceive the efficiency of ICT in many disciplines, from education and commerce to work activities. Unfortunately, due to a lack of innovation in this field, South Africa is falling behind other upper-regional countries in terms of ICT advancement. This may be due to inadequate infrastructure, which results from historical and modern factors; people living outside of urban areas do not have access to the Internet. Consequently, this widens the digital divide and presents challenges that other countries are effectively tackling.

The study's findings provide a detailed analysis of the participant's quality of life and show a notable improvement. Fibre Internet installation solved problems such as access to financial services, online learning materials, job searches, news channels, and work-related responsibilities. Issues with general Internet access, duties related to work, online learning resources, financial services, job searching, and news channels were all addressed by the deployment of fibre Internet. Significant improvements were made in terms of consistent access to social networking platforms, entertainment channels, educational materials, work-related activities, and online shopping, underscoring the positive impacts of the affordably priced uncapped fibre Internet.

The study's recommendations provide helpful information based on its conclusions. This research highlights the importance of Internet access for homes, even in the face of limited financial resources. To effectively close the digital divide, it demands tailored support from public and private sector organisations that provide inexpensive and subsidised Internet services. For a better understanding of this digital divide and digital exclusion, this study recommended a holistic approach that emphasises the need for tailored solutions to address diverse community issues. The study suggests replicating this research in other areas to gather comprehensive insights.



**Keywords:**

Information and communication technology, fibre-based Internet, lower to middle communities, Gauteng, digital divide, digital society, digital inclusion

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| | |
|---|---|
| DD | Digital Divide |
| DI | Digital Inclusion |
| EDA | Exploratory Data Analysis |
| GP | Gauteng Province |
| ICT | Information Communication Technology |
| IT | Information Technology |
| ISP | Internet Service Provider |
| LSM | Living Standards Measure |
| NWU | North-West University |
| POPI | Protection of Personal Information |
| SME | Small to Medium Enterprise |
| SPSS | Statistical Package for Social Sciences |
| WRDM | West Rand District Municipalities |

# CHAPTER 1 INTRODUCTION

## 1.1 Introduction

This study primarily investigates the socioeconomic impact of deploying affordable uncapped fibre Internet in Lower to middle-LSM communities in the West Rand region of Gauteng Province. The study mainly focuses on its impact on the digital divide (DD). Additionally, the research introduces the concept of Digital Inclusion (DI) and its role in bridging the technological gap in areas where people live with Internet disparities. It further seeks to identify practical strategies to address and mitigate the digital divide. While the problem statement of this research highlights elements previously explored in other studies, it uniquely concentrates on the Gauteng region. This focus forms the basis for formulating the aims, objectives, and research questions of this study. This chapter provides context and a defined path for the research by delving into these crucial areas, which include the concepts of DD and DI and how these concepts and others drive the socio-economic development of people in societies.

### 1.1.1 Background

ICT has emerged as a critical tool in driving socio-economic development, leading researchers to explore various challenges within this domain (Chair, 2015:4). These technologies encompass a broad spectrum, including computers, Smart TVs, telecommunications, Internet technology, emails, websites, mobile devices, online banking, and social media. ICT adoption and use can significantly reduce poverty, empower people, and provide more opportunities for both social and economic advancement. ICT is frequently seen as a catalyst that allows developing countries to enter the information age early on, skipping over more traditional stages of development. However, the digital divide, characterised by unequal access to computer and communication systems, hardware, software, and applications across nations, social groups, and organisations, presents a formidable barrier (Pelc, 2018:40).

The historical racial segregation of South Africa during the apartheid era is closely associated with the digital divide, and this is especially noticeable in townships located outside of major cities. A significant portion of the population finds it difficult to access essential ICT infrastructure because of this legacy, including poor accessibility to reasonably priced fibre-based Internet. Policies that prioritise digital inclusion and ensure fair participation in the social and economic life of the country are necessary to address this issue of the digital divide in disadvantaged areas of South Africa (Sieck *et al.*, 2021).

- How has the impact of affordable fibre-based Internet influenced education, employment, and business opportunities within the communities under consideration?
- What are the effects of affordable fibre-based Internet on the health and well-being of residents in the townships mentioned above?
- Do the communities exhibit digital skills gaps that could be reduced through the introduction of affordable fibre?

### 1.1.2 Scope of the Study

The study's scope encompasses three distinct aspects: the specific field of study, the relevant industry, and the geographical demarcation.

### 1.1.3 Field of Study

The study primarily focuses on two critical academic disciplines, with a strong underpinning in responsible management principles. The first is ICT, where the emphasis is on ensuring universal access to fibre-based Internet. This focus aligns with the principles of responsible management by addressing the technology divide, the so-called DD, and promoting equitable access to information, a key driver of sustainable socio-economic development. The second discipline, DI and socio-economic development resonates with responsible management through its commitment to improving conditions in disadvantaged communities. This approach is integral to fostering educational opportunities, entrepreneurship, employment prospects, and overall economic growth, reflecting the core values of social responsibility and ethical management practices in the business sector.

#### 1.1.3.1 Sector Under Investigation

The sector under investigation is ICT Management within the Information Industry. This sector, from a responsible management perspective, plays a pivotal role in sustainable development. It combines manufacturing and service businesses that are crucial for information processing and communication. These businesses, by facilitating access to information and communication technologies, contribute to responsible economic growth and social development. The Information Technology industry, in its role of creating, maintaining, and utilising networks, software, and computer systems, is instrumental in processing and distributing data. This industry's commitment to responsible management practices is evident in its efforts to make technology accessible and sustainable, aligning with the broader goals of social responsibility and ethical business practices.

### 1.1.3.2 Geographical Demarcation

The geographical focus of this study, encompassing Kagiso township in Mogale Municipality and Bekkersdal and Simunye in Westonaria, is situated within the Gauteng Province. This selection is strategic from a responsible management standpoint, as these areas represent a microcosm of the challenges and opportunities in implementing ICT for sustainable development. The study's emphasis on these specific localities aligns with the principles of responsible management by seeking to understand and address the unique socio-economic challenges faced by these communities. The focus on enhancing digital inclusion in these areas reflects a commitment to responsible and ethical management practices, aiming to foster equitable growth and development.

The City of Johannesburg, Mogale City and Westonaria are interconnected relatively well (refer to Figure 1-1). Gauteng's Western Highway includes the development of two main urban centres, Kagiso and Krugersdorp. The R512 and the train line provide the best east-west transportation connections between Mogale City and the City of Johannesburg. The N14/R28 motorway connects Mogale City and the City of Tshwane (Local Government Handbook 2015). The City of Tshwane and Westonaria (Simunye and Bekkersdal) are connected through the R28, while Johannesburg connects through the N1.

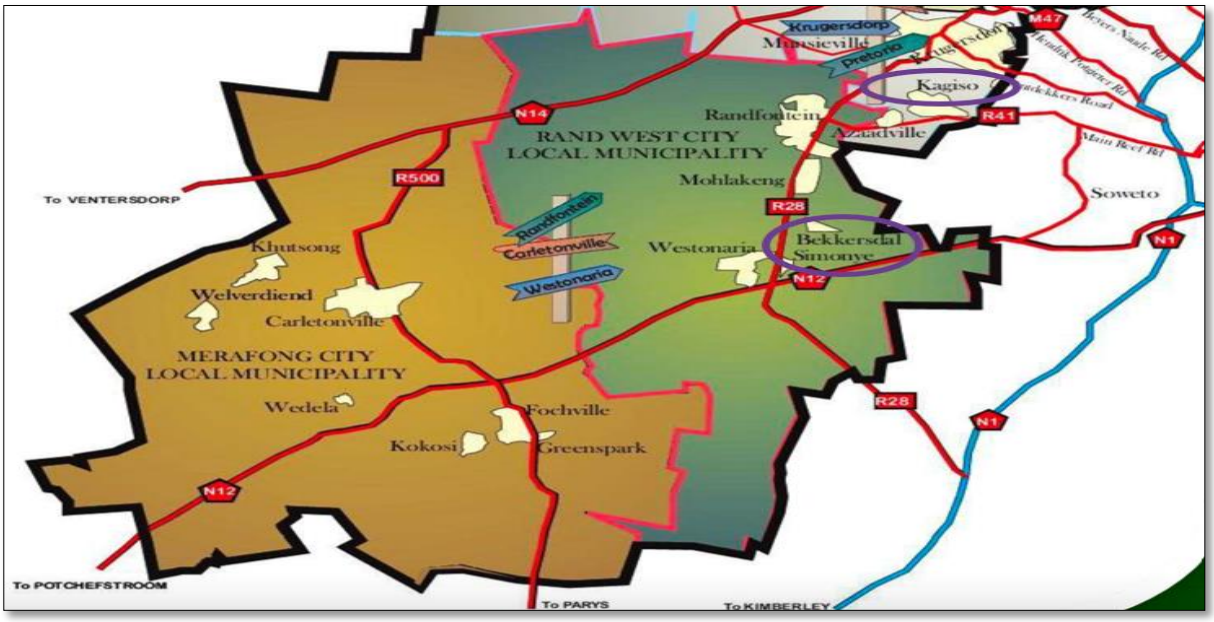


**Figure 1- 1: West Rand City Local Municipality**

**Source: 2014 & 2017 Spatial Development Framework**

The population distribution of the WRDM from 2011 to 2016, as depicted in Figure 1-2, reflects significant demographic changes crucial for responsible management considerations. Over the last five years, there has been a notable increase of 21,442 people, growing from 362,422 in

2011 to 383,864 in 2016. This demographic shift, particularly the substantial population in Mogale City, the highest among all the WRDM local municipalities, underscores the increasing need for sustainable and responsible management practices in the region.

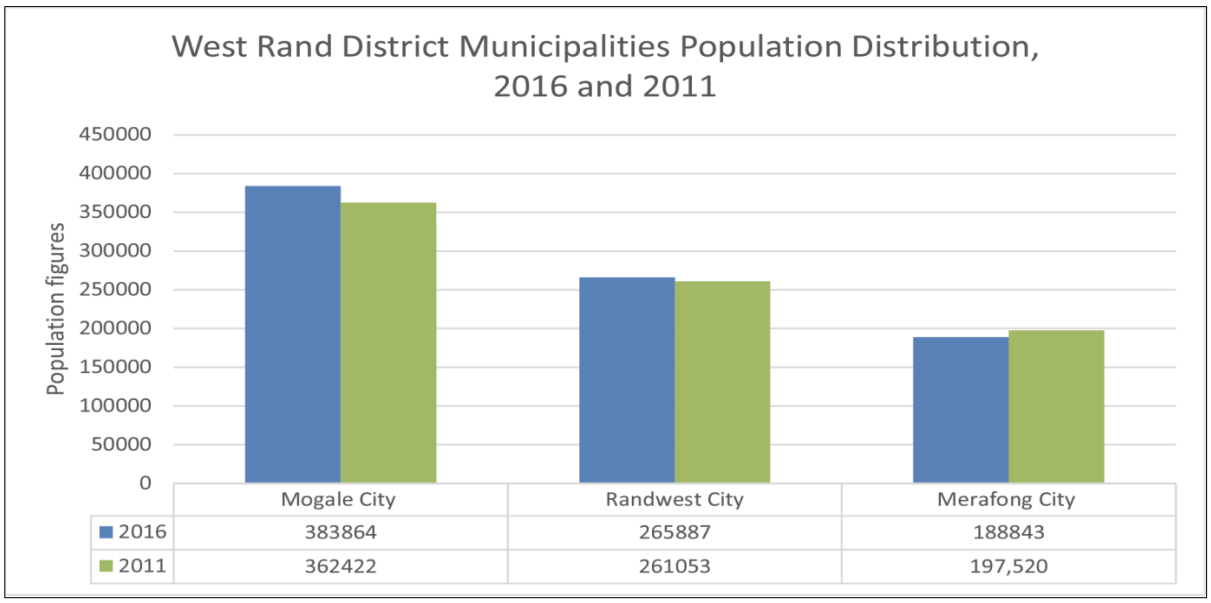


**Figure 1- 2: West Rand District Municipalities Population Distribution**

**Source: Census 2016, Statssa**

Understanding these population dynamics is essential for responsible management, especially in the context of ICT and digital inclusion. The growing population indicates a rising demand for digital infrastructure and services, which must be met with sustainable and equitable strategies. Responsible management in this context involves not only addressing the immediate needs of the population but also anticipating future challenges and opportunities that come with population growth. This includes planning for adequate digital infrastructure, ensuring equitable access to technology, and fostering socio-economic development that benefits all segments of the population, aligning with the broader goals of sustainable and ethical business practices.

### 1.1.4 Research Methodology

This study adopted a two-phase approach in its execution. The first phase involved conducting a comprehensive literature review to explore the social and economic impacts of the digital divide and digital inequality on disadvantaged communities in South Africa. This phase was dedicated to establishing a robust foundation of knowledge by scrutinising existing research and studies pertinent to the subject. It mainly focused on understanding the challenges faced by disadvantaged communities in the Gauteng Province.

Following the literature review, the study proceeded to primary data collection through empirical research. This phase was meant to investigate the specific factors contributing to the experiences of lower to middle-LSM communities in Gauteng Province. Primary data, as defined by Grimsley (2017), comprises information and statistics collected, analysed, and interpreted exclusively for the current research study. To facilitate this, a meticulously designed research methodology was employed, encompassing key components such as the research paradigm, methodological approach, methodological choice, methodological strategy, time horizon, and techniques for data collection and analysis.

The research paradigm was used to set the philosophical underpinnings of the study, while the methodological approach dictated the overall direction and perspective of the research. The methodological choice, in alignment with the research objectives and the positivist research philosophy adopted in this study, was determined subsequently. The methodological strategy detailed the specific steps and procedures for data collection and analysis. Moreover, the time horizon was established to define the temporal scope of the research.

Data collection techniques were utilised to gather pertinent information directly from the target participants, facilitating a comprehensive understanding of the social and economic impacts. The analysis techniques, selected with care, aimed at extracting meaningful insights from the collected data.

The following sections offered detailed discussions on each of these components, crafting a holistic approach that enabled a systematic investigation of the socio-economic impacts on disadvantaged communities within the Gauteng Province.

### 1.1.5 Literature Review

To achieve the primary and secondary objectives of this study, an extensive literature review was conducted, focusing on the socio-economic impacts and consequences of the digital divide in disadvantaged areas of South Africa. This review utilised secondary data sourced from a variety of academic materials, including books, the NWU repository, news articles, journals, publications, dissertations, papers, and Internet resources. This comprehensive exploration of secondary data helped to construct a theoretical framework that addresses the research problem, offering valuable insights and knowledge for developing a robust conceptual model. The synthesis of existing literature laid a solid foundation for addressing the research objectives, enabling a deeper understanding of the socio-economic impacts of the digital divide on lower to middle-LSM communities in Gauteng.

### 1.1.6 Empirical Study

The empirical phase of this study involved primary data collection to investigate the socio-economic effects of deploying affordable, fibre-based Internet in lower to middle-LSM communities in Gauteng. This phase adopted an empirical quantitative research approach, emphasising data quantification in both collection and analysis. This approach, rooted in the natural, social, and applied sciences, employs a deductive method where the focus is on testing theory. Quantitative research is characterised by its formal, objective, and systematic strategies for knowledge generation and refinement (Mohajan, 2020), utilising various quantification techniques and procedures across different academic fields.

### 1.1.7 Research Paradigm

This study adopted a quantitative and positivistic research paradigm, suitable for accurately and precisely examining the relationship between variables in an objective manner. The positivistic paradigm assumes objectivity and minimises the researcher's influence, focusing on facts and employing logic and reasoning to analyse variable correlations (Collis & Hussey, 2014:43).

### 1.1.8 Research Approach

The study followed a deductive, highly structured research approach, utilising larger samples to maintain the researcher's objectivity. The deductive approach begins with an established theory or generalisation and tests its applicability to specific instances (Hyde, 2000). To achieve objective results applicable to a larger population, primary research questionnaires were used instead of existing statistics for data analysis. The research population, already identified in the organisation's database, received the questionnaires in compliance with the POPI Act. These questionnaires were distributed via email, a communication channel already used for invoices and statements.

### 1.1.9 Methodological Choice

Given the nature and objectives of this research, a mono-method quantitative study was deemed the most appropriate methodological choice. This approach involves a single method of data collection, such as a questionnaire, coupled with a quantitative analytical process, exemplifying a mono-quantitative technique study (Saunders *et al.*, 2016). The primary aim of quantitative research, aligned with the positivistic paradigm, is to explore hypothesised relationships between variables using numerical data from large samples and statistical analysis.

### 1.1.10 Research Strategy

The research strategy for this study involves a questionnaire technique distributed via email. The questionnaire was structured, allowing respondents to complete it at their convenience. It consisted of closed-ended questions with predetermined responses for the collection of primary data.

### 1.1.11 Time Horizon

A cross-sectional study design was employed. Cross-sectional studies are characterised by collecting data at a specific point in time, without a time dimension, as all data refer to the time at or near the collection period (Kesmodel, 2018). The samples, drawn from various locations within the same middle-LSM populations, were evaluated simultaneously despite differing durations of Internet connectivity (three, six, or nine months). Deductive reasoning was applied throughout the study.

### 1.1.12 Population and Sampling

#### 1.1.12.1 Study Population

This study employed a stratified sampling strategy, dividing the entire population into smaller groups or strata based on common characteristics. Stratified random sampling aimed at minimising human bias in sample selection, thereby providing a representative sample of the population under study (Hirzel & Guisan, 2002). The population was segmented by criteria such as age group and occupation. The focus was on communities in Kagiso, Simunye and Bekkersdal that have been provided affordable fibre-based Internet by the organisation. Participant data, maintained in the organisation's database, formed the basis of the research sample. This population, which has gained Internet access through the initiative, were contacted via email. Key characteristics of this population include employment status, housing conditions, computer literacy, educational background, and usage of affordable unlimited Internet fibre.

#### 1.1.12.2 Sampling

Data was collected from all willing participants in the database, ensuring a comprehensive representation of the population. The population was divided into strata, and a simple random sample will be taken from each, with the possibility of weighting and combining the findings for enhanced statistical efficiency. Participants were categorised based on factors like location, age, gender, education level, and employment status. The aim is to use all collected data to

inform a fully representative business case. Google Forms were utilised for efficient data grouping into strata.

### 1.1.13 Inclusion and Exclusion Criteria

**Inclusion criteria:**

- Participants who have received fibre-based Internet from the organisation's initiative.
- Participants who have consented to be part of the study.
- Active users of the provided Internet connectivity.

**Exclusion criteria:**

- Those who declined participation or did not consent.
- Recipients of fibre-based Internet who are not using it.
- Inaccessible participants via email or telephone.

### 1.1.14 Sampling Technique

The study used stratified sampling, collecting data from all available participants in the database. This technique allows for control over sample sizes in each stratum, enhancing statistical efficiency. Participants were grouped into categories like township, age, gender, education, and employment status. All received data was used for the study, ensuring full population representation. Tools like Survey Monkey or Google Forms aided in data stratification.

#### 1.1.14.1 Sample Size

Following Malhotra (2015, 274) and Hair *et al.,* (2014, 100,171), the targeted sample size is 315 respondents, with an equal split between Kagiso and Bekkersdal and Simunye. This size would ensure statistical significance and adequate representation of the population. Selection criteria include receiving fibre-based Internet from the initiative, active usage, and consent to participate in the study.

### 1.1.15 Relationship Between Researcher & Participant

The organisation deployed fibre Internet through its affordable fibre initiative in the specified areas. Therefore, the participants are customers of the organisation, having received affordable fibre-based Internet for varying durations. The researcher, external to the organisation, maintains an objective stance with no conflict of interest. The study's registration with the university's ethics committee and oversight by a research supervisor and organisational management ensures scientifically valid outcomes, free from undue influence by secondary interests.

### 1.1.16 Designing the Measuring Instrument

To collect the primary data necessary to achieve the objectives of this study, a measuring instrument in the form of an online, closed-ended, self-administered, and structured questionnaire was developed. There are three sections to the questionnaire. Section A focuses on acquiring the respondents' demographic information, such as age group, level of education, occupational questions, and household income. The relevance of this section helped when analysing data and finding out which age group primarily uses the fibre, what their education level is and whether they are unemployed, employed, or self-employed. Section B seeks to collect economic information, such as the township, fibre package, level of computer skill and number of people in the household. Section C and D makes use of a five-point Likert scale in which the respondents can indicate their level of agreement with statements measuring the independent variables (deployed fibre Internet) and the dependent variables (social benefit, economic benefit, financial impact and perceived quality of life) of the study.

### 1.1.17 Collection of Data

The questionnaire was sent to the participants through email because of the online nature of the study. The email message that was mailed to the respondents also included a cover letter that, in addition to asking for their participation, explained the study's goals, ethical considerations, and how to complete the questionnaire. A link to the online questionnaire, made possible by Google's online survey tool, was included in the cover letter. When a respondent accessed the questionnaire, the first page was a written consent form that asked them to agree to the terms of the study and give their approval before they could access the questionnaire. Those participants who could not be reached by email were contacted by phone.

### 1.1.18 Data Analysis

The data collected from the selected sample will be captured and analysed. The chosen analytical software will be SPSS (Statistical Package for Social Sciences), which has broad coverage of many formulas and statistical routines. The aim is to investigate the socio-economic impact of deploying affordable and uncapped fibre-based Internet in lower to middle-LSM communities in Gauteng and gain an in-depth understanding of whether there is an impact socially, economically and increased quality of life and when factors, such as access to the Internet, have a positive impact on these communities. Indeed, enhancing the content with academic references in Harvard style provided a more robust and credible foundation for the mini dissertation. Here are how the sections could be revised:

#### 1.1.18.1 Exploratory Data Analysis (EDA)

The initial step in data analysis involves conducting a thorough exploratory data analysis (EDA), focusing on descriptive statistics. This approach aligns with the recommendations of Trochim and Donnelly (2001), who emphasise the importance of understanding the dataset's essential characteristics before proceeding to more complex analyses.

Consistent with the suggestions of Healey and Sawitzki (2009), various visualisation tools such as histograms, box plots, and scatter plots were utilised. These techniques aid in visually representing the distribution and relationships of key variables, facilitating an intuitive understanding of the data.

#### 1.1.18.2 Univariate and Bivariate Analysis

In line with the approach outlined by Black (2010), each variable was analysed independently to identify specific trends and patterns. This univariate analysis is crucial for understanding the unique characteristics of different demographic groups within the sample.

Exploring variable relationships: our bivariate analysis, as suggested by (Cohen *et al.*, 2018), was examined the relationships between pairs of variables. This includes assessing correlations between Internet access and socio-economic factors, a key aspect in understanding the broader impacts of fibre-based Internet.

### 1.1.19 Limitations and Implications

The limited size of 135 respondents, while sufficient for EDA, restricts our ability to perform more complex statistical analyses (Field, 2013). This limitation and its implications on the study's findings were acknowledged.

The study also considered the potential for response bias (Fowler Jr, 2013) and its impact on the generalizability of the findings.

### 1.1.20 Reporting and Interpretation

The findings from our analysis were presented with an understanding of the limitations imposed by the sample size. Interpretations were made carefully to ensure accuracy and relevance to the study's objectives (Silverman, 2013).

The results and their implications were discussed in a clear, non-technical manner, making them accessible to a broad audience, including non-experts in statistical analysis (Walliman, 2021).

### 1.1.21 Reliability and Validity

#### 1.1.21.1 Reliability

In quantitative research, reliability refers to the ability of a measurement tool to consistently produce the same results under unchanged conditions (Bryman *et al.*, 2014:36). Reliability encompasses the stability and internal consistency of the measure. Stability implies that the measurement instrument remained consistent over time, and if administered again under the same conditions, the results should be comparable. The test-retest method, which involves administering the same test to the same sample at two different times, is a straightforward approach to ascertain if the scale is stable (Bryman *et al.*, 2014:36).

Internal consistency concerns whether the items on the scale consistently reflect the construct they are intended to measure (Field 2009:673). A common method for testing internal consistency is the split-half method, where the study sample is divided into two groups, and the correlation between these halves is examined (Bryman *et al.*, 2014:37). Cronbach's coefficient alpha can be used to calculate the average of all possible split-half reliabilities, ensuring consistency in how the sample is divided into two groups. Generally, an alpha of 0.8 is considered an acceptable level of internal consistency (Bryman *et al.*, 2014:38). Although this study will utilise scales whose reliability has been previously established, for scientific

rigour, the reliability of the measuring instrument within the context of this study were assessed using Cronbach's coefficient alpha.

#### 1.1.21.2 Validity

In quantitative research, validity refers to the degree to which a chosen measuring instrument, or the set of indicators it comprises, accurately measures the concept it is intended to measure (Bryman *et al.*, 2014:38). Face validity involves assessing how well a measure appears to assess the underlying concept at face value and is typically evaluated by consulting with experts in the field. Construct validity of a scale pertains to how well it measures the primary construct it is intended to assess (Bryman *et al.*, 2014:39). To establish construct validity, data should be collected from multiple sources. Evidence must show that the scale possesses convergent validity, meaning it measures what it is designed to measure, and discriminant validity, meaning it does not measure unintended or irrelevant attributes. Exploratory and confirmatory factor analysis, akin to the approach used by Flotman and Grobler (2020:5), were employed to assess construct validity.

### 1.1.22 Ethical Considerations

#### 1.1.22.1 Ethical Issues and Definitions

**Permission from ISP**: Permission was sought from the Internet Service Provider (ISP) to access user information, ensuring compliance with data protection laws and ethical standards.

**Voluntary Participation**: Participants in the study had the autonomy to opt in or out at any stage, emphasising respect for individual choice.

**Informed Consent**: Participants were fully informed about the study's purpose, potential benefits, and risks before deciding to participate, ensuring transparency and understanding.

**Anonymity**: The participants' identities remained unknown to the researcher, and no personally identifiable information was collected, safeguarding participant privacy.

**Confidentiality**: While the researcher may know who the participants are, their information was kept private and anonymised to prevent linkage with other data, ensuring data security.

#### 1.1.22.2 Voluntary Participation

Participants were thoroughly informed about the study's objectives and methodology. They were assured of their right to freely choose participation in the research and the option to withdraw at any time without any negative consequences, thereby respecting their autonomy.

#### 1.1.22.3 Informed Consent

Participants will receive comprehensive information about:

- The study's purpose.
- The potential risks and benefits of participation.
- The duration of the study.
- Contact details for queries and the North-West University’s ethical conduct approval number.

Participants were assured of data privacy and the freedom to discontinue participation or request data removal at any point by contacting the researcher or the company.

#### 1.1.22.4 Data Pseudonymisation

Given that participants provided demographic information such as age, gender, nationality, and ethnicity, the data was pseudonymised. Each participant was assigned a unique identifier, and personal details like identity numbers, phone numbers, and addresses were excluded from the study. This approach ensures that survey data can only be linked to individuals through their unique participant numbers.

#### 1.1.22.5 Confidentiality

Measures will be implemented to maintain the confidentiality of participant data and safeguard it against privacy threats. All consent forms will be stored electronically on a secure server, protected by a firewall and password access restricted to authorised individuals only. Access to the data was limited to company managers specifically assigned and approved for the study, who were well-versed in and adhered to the company’s data privacy policies as outlined in the Protection of Personal Information (POPI) Act. To further ensure the security of participant and company information, these managers were required to sign a confidentiality agreement, and the researcher l signed a non-disclosure agreement.

### 1.1.23 Contributions of the Study

#### 1.1.23.1 Theoretical Contribution

This research significantly enriches the academic discourse on the digital divide, particularly in South Africa's lower-middle-LSM communities. It uniquely explores the nexus between affordable digital connectivity, specifically uncapped fibre, and its influence on social and economic success factors. Additionally, it delves into the perceived quality of life improvements attributed to digital connectivity, thereby broadening the scope of understanding in this field.

#### 1.1.23.2 Practical Contribution

While global studies on digital exclusion are abundant, this research fills a critical gap in the South African context. It pioneers primary research in examining the effects of affordable fibre Internet deployment in specific South African communities. The study's framework for assessing the socio-economic implications of fibre deployment can guide businesses in the sector for strategic decision-making. Furthermore, it explores unique business models tailored to providing affordable fibre Internet in these specific areas, diverging from models used in more affluent regions.

#### 1.1.23.3 Industry Contribution

This study paves the way for potential collaborations between businesses and government entities, aiming to enhance educational and training facilities. It underscores the importance of equipping the youth with computer skills pertinent to the Fourth and emerging Fifth Industrial Revolutions. This revolution emphasises human-machine collaboration, preparing communities to harness technological advancements for their benefit.

### 1.1.24 Limitations of the Study

While this study contributes significantly to understanding the digital divide and the impact of affordable fibre in disadvantaged communities, it acknowledges certain limitations. These limitations, such as the geographical focus on Gauteng and the use of non-probability sampling, provide avenues for future research. The study's scope, primarily focused on specific townships with affordable uncapped fibre deployment, does not aim for generalisation but rather a detailed exploration of the phenomenon within these communities.

### 1.1.25 Document Layout

The remainder of this document is structured as follows:

- Chapter 2: Literature Review: This chapter presents a comprehensive analysis of existing literature related to the study's topic. It demonstrates the researcher's extensive knowledge and the relevance of the study within the broader academic field.

- Chapter 3: Research Methodology: Focused on the research design and methodology, this chapter details the data collection methods, analysis procedures, population size, and sampling method.

- Chapter 4: Results and Discussions: This chapter presents and interprets the findings, offering a detailed discussion of the implications of the research data.

- Chapter 5: Conclusions and Recommendations: The final chapter synthesises the research findings, drawing conclusions and formulating recommendations based on the study's outcomes.

## 1.2 Conclusions

The section of the study forms the academic and theoretical basis of the study. It covers the study's background, research methodology, literature review, empirical study, and the chosen research strategies. This section is intended to showcase a strong theoretical understanding of the topic and lays the groundwork for applying this knowledge in the practical scientific aspects of the study in the upcoming chapters.

# CHAPTER 2 LITERATURE REVIEW

Digital technologies have become an integral part of our daily lives, and their significance has been further amplified during the COVID-19 pandemic. This global crisis has underscored the critical importance of digital inclusion, which aims to ensure that all individuals have equal access to and can effectively utilise digital technologies. Particularly in the realm of education, digital inclusion is essential for providing equal educational opportunities to individuals from diverse backgrounds and locations. Lack of access to reliable, fast Internet and technological learning tools has a significant negative effect on students, especially those who need extra support and may be marginalised (Impact, 2021:4). According to Chivunga and Tempest (2022:4), barriers to digital inclusion encompass several factors, including the unaffordability of technology, limited connectivity arising from inadequate infrastructure or communication networks, insufficient digital literacy resulting from low levels of basic literacy and technical skills, discrimination based on gender, race, ethnicity, and age, and a lack of inclusivity due to non-standard designs of ICT and user interfaces. Additionally, obstacles such as language barriers, capacity differences, and disabilities further contribute to the challenge of achieving digital inclusion.

Providing everyone with safe and affordable Internet access is critical to realising the full potential of digital technologies and advancing the attainment of digital inclusion (Deganis *et al.*, 2021:20). This inclusivity is particularly important for community development, especially in rural and disadvantaged areas. Insufficient access to reliable and high-speed Internet, as well as technology tools for learning, significantly hampers learners, particularly those who need additional support and face marginalisation (Impact, 2021:4). According to Huxhold *et al.* (2020:271), the Internet is a vital component of modern society, enabling access to information, medical interventions, and social engagement. Digital inclusion requires collaborative efforts between governments, businesses, and individuals to ensure that everyone has equitable access to and can effectively utilise digital technologies.

The digital divide is a global issue that impacts communities and societies worldwide. According to Chivunga and Tempest (2022:4), the digital divide presents challenges that impact individuals and communities, including social isolation, limited access to education and employment, and widened social and geographical disparities. Lack of Internet access during the pandemic intensifies social isolation, especially for those in rural areas. A significant portion of young people lacks Internet connectivity, hindering their educational opportunities. A joint report by the International Telecommunication Union (ITU) and UNICEF reveals that a significant portion of young people, approximately 63% of those aged 15 to 24, lack Internet

connectivity at home, hindering their educational opportunities. Limited access to ICTs creates barriers to employment. Technological discrimination leads to dependence and vulnerability. The digital divide reinforces inequalities, emphasising the importance of inclusive digital access and resources.

Previous research has demonstrated that when examining the digital divide, it is crucial to also consider the concept of digital inclusion, which encompasses digital skills, technologies, and policies aimed at bridging the divide. By delving into the topic of the digital divide, this study seeks to uncover the disparities in access to digital resources and technologies among different communities. However, it goes beyond identifying the divide itself and emphasises the importance of digital inclusion to mitigate these disparities. Digital inclusion encompasses various factors, such as the acquisition of digital skills, the utilisation of technological tools, and the implementation of policies that promote equal access and participation in the digital realm (Gurung, 2018a:51). By focusing on digital inclusion, communities can harness the benefits of digital technologies, enhance their digital literacy, and bridge the gap in access to digital resources (Wamuyu, 2017). This includes fostering the development of necessary skills, providing equal opportunities for technological engagement, and implementing policies that promote digital equality.

Digital inclusion is essential for economic growth, educational opportunities, community development, and social inclusion (Reder, 2015:5). Rather than solely focusing on the digital divide, this paper proposes a shift in perspective towards highlighting the positive side of digital inclusion. While acknowledging the importance of understanding the challenges posed by the digital divide and formulating strategies to address them, it is equally crucial to explore the potential benefits that can arise from widespread and inclusive technology usage across communities and societies. By emphasising the positive aspects and examining the opportunities that arise from proper technology utilisation, this approach aims to foster a more comprehensive understanding of digital inclusion and its transformative impact on various sectors.

### 2.1 Digital Disparities and Societal Impact: A Global Perspective

When compared to younger people, older persons have lesser Internet access, with a large proportion of older adults in the United States and Europe not utilising the Internet (Gray *et al.*, 2022:11). Globally, digital disparities are recognised as a negative concern that threatens to redefine inequality. They are caused by population disparities in Internet availability, digital literacy, and measurable impacts such as economic and health results (Kessel *et al.*, 2022:1). Gender, age, education, and socioeconomic status have all been researched concerning the

digital divide (Gómez, 2020:2; Zhang, 2023). However, the focus has shifted from the access or no access discussion to examining digital inequalities among those who have Internet access (König & Seifert, 2020:7).

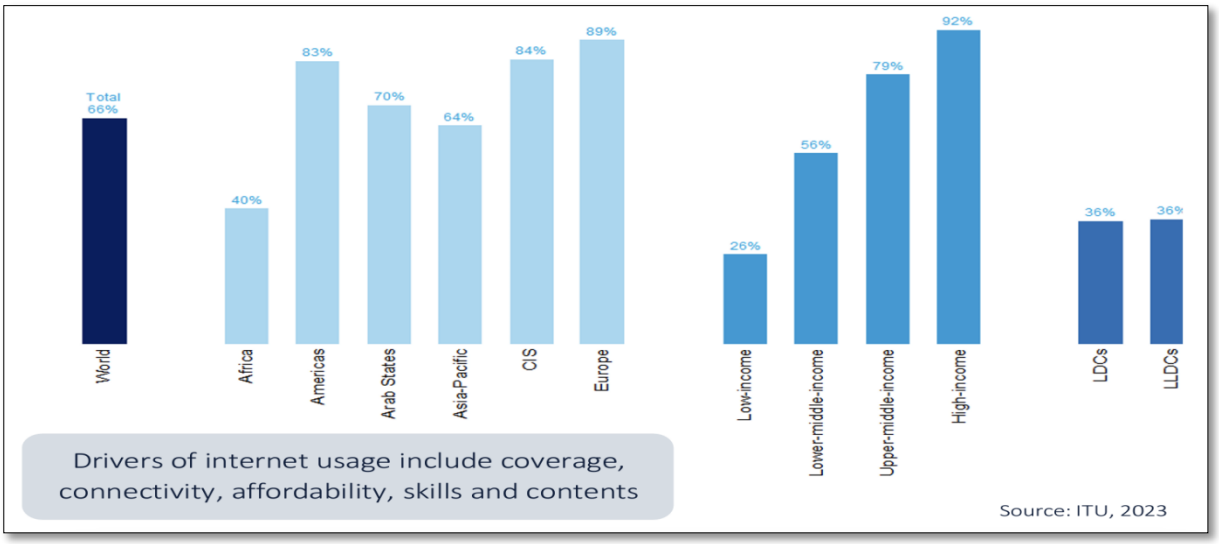


**Figure 2- 1: % of individuals using the Internet by region 2022.**

**Source: ITU, 2023**

The European Commission's Skills Agenda for Europe (Mangas *et al.*, 2023:3) sought to close the digital skills gap while also promoting human development, employability, and competitiveness. It emphasised the importance of improving education and training systems to provide individuals with the requisite digital capabilities (Mangas *et al.*, 2023:3). The agenda recognised the importance of digital skills in entrepreneurship, innovation, and economic growth (Mangas *et al.*, 2023:20). Education, employment markets, and healthcare are only a few of the societal effects of the digital divide in Europe (Laamanen *et al.*, 2022; Woolley *et al.*, 2023).

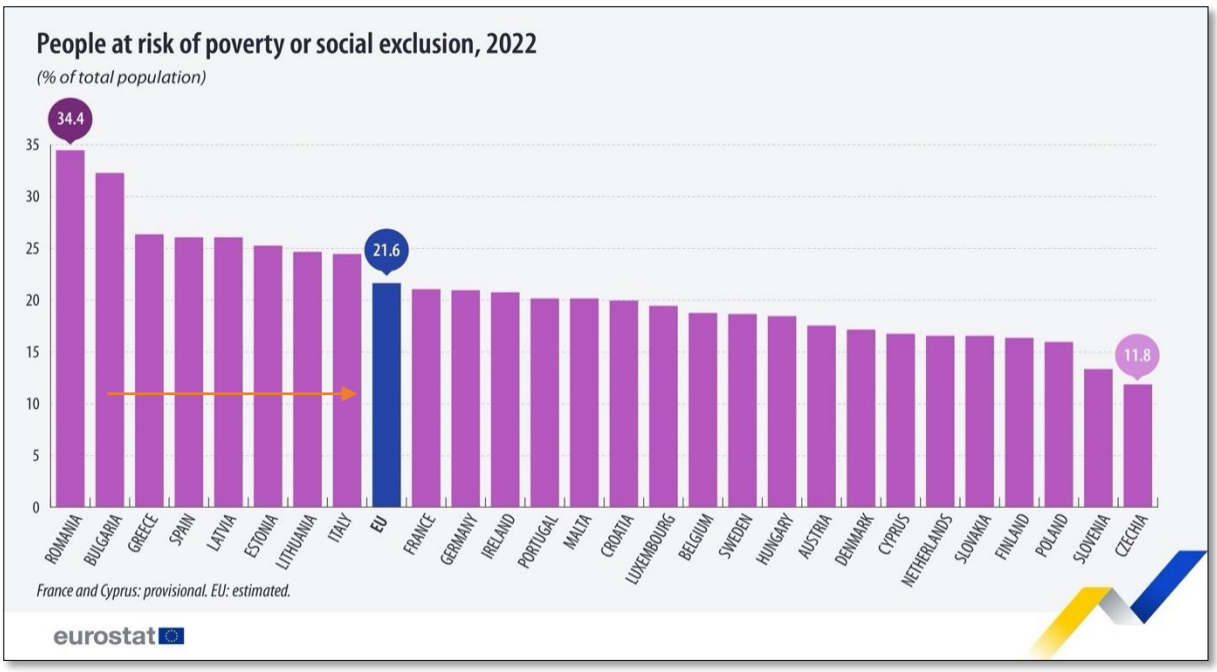


**Figure 2- 2: People at Risk of social exclusion in Europe, 2022.**

**Source: Eurostat, 2023**

According to a recent analysis from 2020, Northern Europe ranked first in terms of Internet penetration rate (IPR), which measures the proportion of a population using the Internet (Chia *et al.*, 2020:11). Northern America came in second, followed by Western Europe. According to the Internet penetration rate, Southeast Asia was in ninth place. According to the results of the study by Kessel *et al.* (2022:2), Europe is presently unable to support a sustainable digital society without escalating inter-country disparities in access to the Internet and digital literacy. To ensure that they can profit efficiently, fairly, and sustainably from the advancements of the Digital Era, European countries must invest in increasing digital capacity among the general people, according to Kessel *et al.* (2022:2). Hungary, Spain, and Slovakia are all grouped in studies that categorise EU nations according to their digital proficiency (Kaygisiz, 2022). These findings support the assertion that although Europe performs better than other parts of the world on average in terms of digital skills, large intra- and inter-country gaps continue (Kessel *et al.*, 2022).

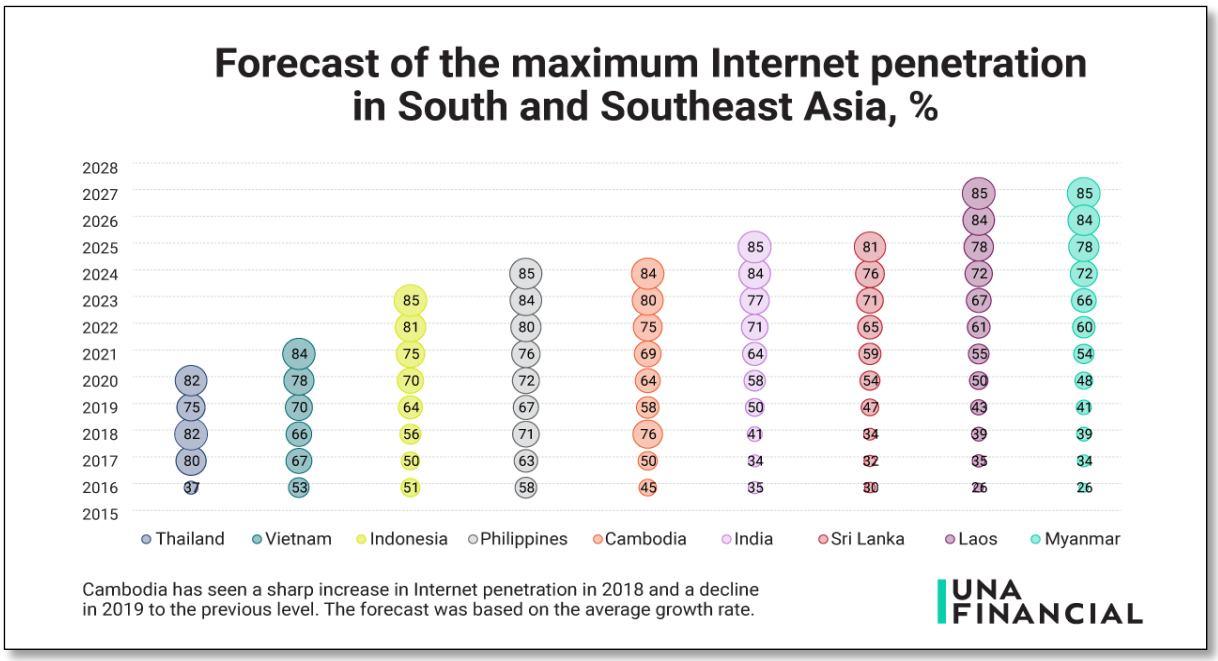


**Figure 2- 3: Over 50% of Internet users in Asia will be using digital financial by 2025.**

**Source: Trade Travel Journal, 2020**

Roman-Urrestarazu *et al.* (2022) findings suggest that the current state of advancement in digital healthcare-seeking behaviour is not sustainable. A crucial step towards removing barriers in the digital infrastructure could be taken by initiatives like the Biden Administration's in the United States of America, which plan to give Internet access to 48 million low-income households (Roman-Urrestarazu *et al.*, 2022), while the creation of educational resources and training programmes can help to mitigate the paradoxical effects of digital healthcare (Lazarus *et al.*, 2022). Policymakers carry the potential of widening already-existing digital disparities if decision-makers do not address the underlying lack of access to digital infrastructure and underdeveloped digital skills before structurally deploying digital health solutions (Kessel *et al.*, 2022:12). Capacity-building efforts in the areas of digital infrastructure and skills can be combined with the broad introduction of digital health technologies to ensure that both patients and healthcare professionals are able to recognise the value of digital health tools once they enter the overall healthcare market (Agrawal *et al.*, 2022:4). Careful planning and strategic deployment of digital inclusion initiatives can enable policymakers to achieve their intended objectives. The existing literature strongly supports the notion that digital inclusion and access to digital technologies offer numerous advantages that benefit society in various ways. Therefore, it is evident that digital inclusion has the potential to bring about significant positive impacts across multiple domains, contributing to the betterment of society as a whole.

### 2.1.1 Digital Disparities in Africa's Internet Access

From 2021 to 2022, Internet usage in Africa grew by 9%. However, the continent still falls behind the global average, with only 40% of the population using the Internet in 2022. Internet access remains highly unequal worldwide. While high-income countries are approaching near-universal connectivity, only 36% of the population in the least developed countries (LDCs) and landlocked developing countries (LLDCs) have Internet access (Tralac, 2023:11). However, according to Chivunga and Tempest (2022), the issue of limited connectivity is not exclusive to Africa. More than 3.7 billion individuals in low- and medium-income countries lack access to the Internet. However, these countries must have reliable and affordable infrastructure, along with digital skills, to ensure access to connectivity. This is essential for their full participation in the digital economy and the ability to rebuild their economies. Niyigena *et al.* (2020:22), have demonstrated that having access to technology infrastructure does not necessarily mean that ICT facilities will be effectively utilised.

This aligns with previous studies mentioned earlier, which indicate that simply having access to digital technologies does not automatically result in increased usage. This is where the importance of digital literacy and training comes into play. For instance, East Africa was placed 63rd, North Africa was 48th, West Africa was 60th, and Southern Africa was 45th in the 2015 Economist Intelligence rankings that evaluated online readiness. This shows that despite having access to technology infrastructure, East Africa must combat the broadband competition (Niyigena *et al.*, 2020:22). The East African Community (EAC), which consists of the United Republic of Tanzania, the Republics of Burundi, Kenya, Uganda, Rwanda, and South Sudan, is known as East Africa (EA). Despite Africa representing 16% of the global population, it only accounts for 4% of Internet access (Lavery *et al.*, 2018:2). While it is challenging to currently validate the accuracy of the statement in 2023, there appears to be a certain degree of agreement in the literature that digital inclusion has the potential to create new employment opportunities and contribute to economic growth.

As an example, in South Africa, the contribution of broadband to the GDP has been estimated at 1.38%. This is a noteworthy figure, especially considering the efforts to reduce a 26% unemployment rate through accelerated economic growth. South Africa has planned an R65 billion investment in broadband, which is expected to generate 400,000 jobs and increase the annual GDP by R130 billion (Lavery *et al.*, 2018:2).

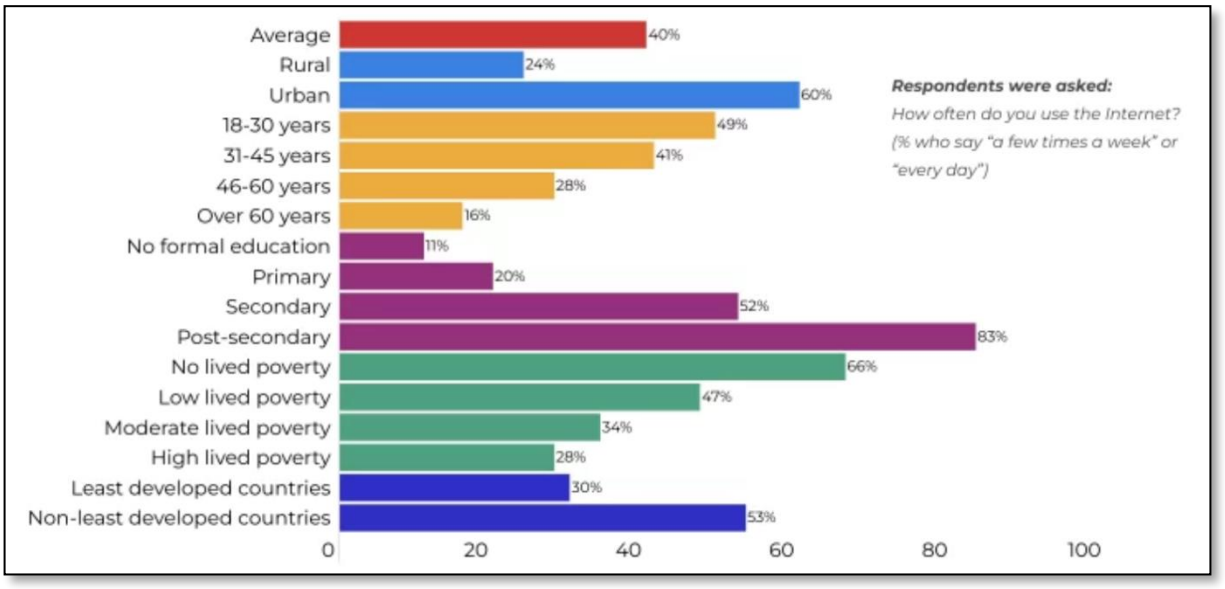


**Figure 2- 4: Frequent use of the Internet by demographic group 34 African countries in 2019/2021**

**Source: Afrobarometer & Malephane, 2022**

According to Afrobarometer and Malephane (2022:16), there is a clear correlation between economic status and Internet usage, both at the individual level and when comparing least-developed countries to non-least-developed countries. This finding aligns with previous studies that have shown how privileged and educated individuals within society tend to have greater access to and make more use of the Internet compared to those who are less privileged and have lower levels of education.

### 2.1.2 Navigating the Complexities: South Africa's Multifaceted Digital Divide

Africa remains behind the rest of the world in terms of access to the Internet and Internet connection quality, according to the International Communication Union (ITU) (Lembani *et al.*, 2019:6). The digital divide among its population segments is experienced differently in South Africa, which is rated third in Africa and 92nd in the world (Lembani *et al.*, 2019:6). The research conducted on the digital divide in South Africa has shed light on the disparities in Internet access and usage among different population groups.

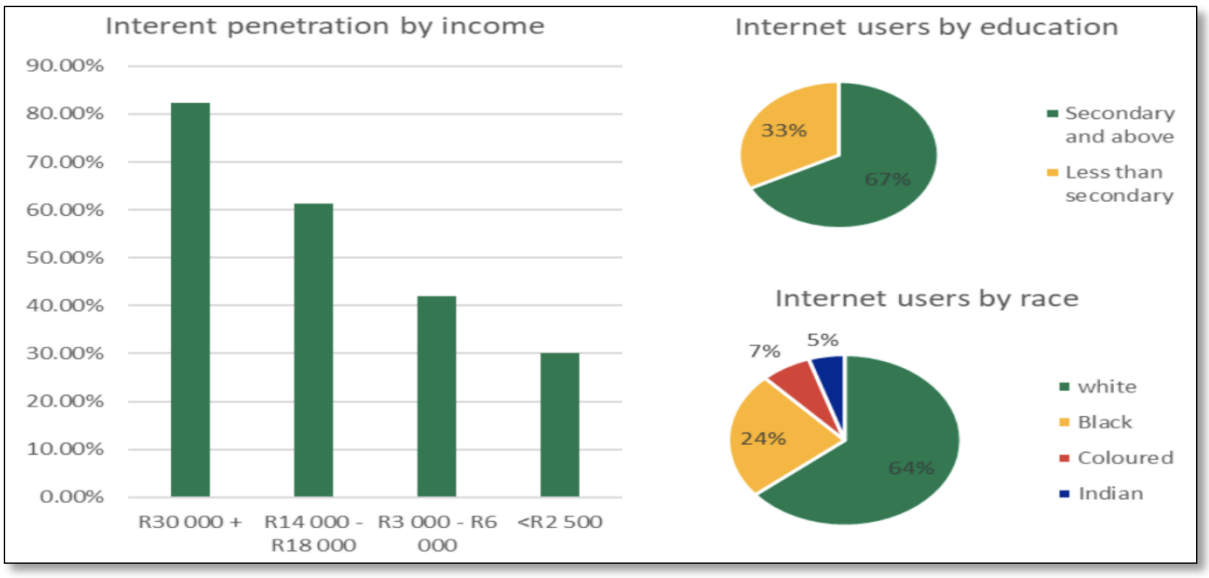


**Figure 2- 5: Internet usage in South Africa**

**Source: Maverick, 2020**

Factors such as income levels, infrastructure availability, and urban-rural disparities significantly influence this divide. Efforts aimed at bridging the digital divide in South Africa should address not only access to technology but also the development of digital skills and capabilities among disadvantaged communities. It is essential to acknowledge the historical context of South Africa and the existing challenges regarding ICT access, as oversimplifying the issue would not capture its complexities (Frans, 2020:15). The digital divide is also evident in the education sector in South Africa. Disadvantaged secondary schools in Gauteng, for instance, face hurdles related to ICT infrastructure, Internet access, and the cultivation of ICT skills among students (Chisango & Marongwe, 2021:151). It is crucial to recognise that the digital divide encompasses more than just access to ICT infrastructure; it also comprises opportunities to develop the necessary skills and capabilities for digital participation (Chisango & Marongwe, 2021:153).

Factors such as lack of access to ICT infrastructure due to geographical constraints and affordability issues contribute to the digital divide in South Africa, particularly in township communities that often face poverty and lack basic infrastructure (Mahajan, 2014:22). While there have been advancements in ICT access and services provided on the Internet, researchers acknowledge the potential for disparities to emerge between different segments of the population, especially in crucial social areas (Azi *et al.*, 2020:146). The digital divide in South Africa extends beyond access to technology and encompasses the urban-rural divide and socioeconomic inequalities (Chisita & Chizoma, 2021; Karar, 2019). Despite increased

Internet users through algorithmic capitalism, the digital divide remains persistent, particularly in rural areas (Karar, 2019).

In summary, the digital divide in South Africa is a multifaceted issue that goes beyond access to technology. It encompasses factors such as socioeconomic disparities, urban-rural divide, and the development of digital skills and capabilities. Bridging the digital divide requires comprehensive efforts that address these various dimensions to ensure equitable digital inclusion for all segments of the population. Therefore, bridging the digital divide in South Africa requires a comprehensive approach that addresses the multifaceted nature of the issue. It involves providing equitable access to technology, developing digital skills and literacy, and addressing socioeconomic disparities and infrastructure limitations. By fostering digital inclusion and empowering all individuals to participate in the digital world, South Africa can unlock the potential of digital technologies for societal advancement, economic growth, and social equality.

### 2.1.3 Creating An Inclusive Digital Society in South Africa

According to Fuchs and Horak (2008), Van Dijk and Hacker (2003), as cited by Bornman (2016:8), it would be an oversimplification to assume that bridging the digital divide can be achieved solely by focusing on providing material access through the establishment of ICT infrastructure. It is evident that infrastructure development and price reduction through increased competition alone cannot effectively transition South Africa into an information society. It is crucial to engage in extensive development endeavours that encompass various segments of the population, intending to bridge not only the digital divide between South Africa and other nations but also the internal divisions within the country (Bornman, 2016:20). To create a truly inclusive digital society, extensive development efforts must be undertaken across various sectors of the population. This means addressing not only the disparities between South Africa and other developed nations but also the internal divisions within the country itself. Recognising the diverse needs and circumstances of different communities and demographic groups is crucial in formulating effective strategies. Civil society organisations have a significant role to play in this process. They serve as vital intermediaries, supporting citizens in accessing and utilising ICT services. These organisations work on the ground, providing guidance, training, and resources to individuals and communities, particularly those who may face barriers to digital inclusion. By empowering citizens with the necessary skills and knowledge, civil society organisations contribute to the development of digital societies and promote active civic engagement.

Furthermore, bridging the digital divide goes beyond mere access to technology. It requires addressing issues related to digital literacy, digital skills development, and fostering a digital culture that encourages active participation and meaningful engagement with digital technologies. This comprehensive approach ensures that individuals and communities not only have access to ICT infrastructure but also possess the necessary capabilities to fully utilise and benefit from digital resources. It necessitates extensive development efforts that consider the unique needs and circumstances of different populations. By addressing both external disparities and internal divisions, South Africa can strive towards a more equitable and inclusive digital society.

### 2.1.4 Affordable Internet Access as a Catalyst for Economic Growth

Affordability poses a significant challenge for developing countries in terms of Internet access, as noted by Bukht and Heeks (2018:7). In less developed countries, the cost of monthly fixed broadband services is typically three times higher compared to developed countries, while mobile broadband prices are twice as costly (Bukht & Heeks, 2018:7). Therefore, affordable Internet access can have positive economic implications, as highlighted by (ITU, 2015). The study emphasises the contribution of the digital economy to economic growth and job creation, underscoring the importance of Internet access for individuals aiming to participate in this economy. Several studies, such as (Bhattacharya & Ghosh, 2020; Billon, Crespo & Lera-Lopez, 2018) emphasise the positive impact of Internet access on economic growth in lower-middle-income and low-income countries such as South Africa. Billon, Crespo and Lera-López (2018) argue that Internet usage positively affects economic growth among middle and high-income earners in various countries.

However, recent research reveals that disadvantaged communities often face limitations in Internet access, with commercial Internet services being slow, expensive, or non-existent, as highlighted by (Analytica, 2020; Mossberger *et al.*, 2021). This creates a situation where Internet access is primarily available to those who can afford it and those residing in more developed urban areas. Recognising this, Internet connectivity has been identified as a public utility that could benefit communities by improving economic growth, as emphasised by (Analytica, 2020; Mossberger *et al.*, 2021). Nipo *et al.* (2022) conducted panel data analysis on 20 Asian countries, demonstrating that fixed telephone subscriptions, mobile cellular subscriptions, and Internet users significantly and positively impact economic growth in the region. This underscores the importance of improving Internet access in disadvantaged communities to promote economic growth and development.

Therefore, there is a need for policies that prioritise digital literacy training, universal Internet access, and affordable Internet provision in low-income urban areas and institutions, as advocated by Wamuyu (2017). Without initiatives that promote equal access to the Internet and ICT technologies, the current situation of unequal distribution of ICT benefits and opportunities across nations, regions, classes, and genders will persist, posing a significant challenge to societies and economies (Gurung, 2018b:51). International examples exist from which South Africa might find motivation One of these is Vietnam, where the government's aim to promote the digital economy has increased access to low-cost, high-speed Internet that will reach 64% by 2020, up from almost nothing in 2000. The current goal of the Vietnamese government is "to connect the majority of the population to 4G and, in the future, 5G mobile networks and further expand broadband fibre-optic networks, particularly for businesses, schools, and large institutions" (Dione, 2020). Making Internet access more affordable and accessible has the potential to reduce economic disparities and promote economic growth by providing more people with access to information, education, and job opportunities. According to findings by Fernández-Portillo *et al.* (2020) asserts that ICT has a beneficial impact on GDP as a whole, with the number of Internet users being the most effective measurement, followed by news reading and social media access. The usage of e-government by public administrations and e-commerce by SMEs are two additional important factors that promote GDP.

Moreover, a study carried out in China by China, Katz, and Jung (2022:2) examined the impact of high-speed Internet on economic growth amid the COVID-19 pandemic. The researchers analysed data from 31 provincial districts and discovered that a 10% rise in high-speed Internet penetration led to a 1.87% increase in GDP growth during the first three months of 2020. Additionally, this study shows there was a 1.30% GDP growth rate during the first four months of that year (Katz & Jung, 2022). This highlights the positive correlation between high-speed Internet access and economic growth. Addressing the challenge of affordability and improving Internet access in developing countries is crucial for promoting economic growth and reducing disparities. Policies should prioritise digital literacy training, universal Internet access, and affordable Internet provision, particularly in low-income urban areas and institutions.

#### 2.1.4.1 Fostering Economic Growth: The Role of Digital Inclusion

According to AlphaBeta (2017:17), universal access to high-speed Internet is a fundamental requirement for a country to become a digital nation. The report highlights that affordable Internet can lead to increased productivity, innovation, and entrepreneurship, which in turn drive economic growth and job creation. Bukht and Heeks (2018:15) suggest providing

targeted support for digital economy start-ups and SMEs, such as business development services, incentive-based mechanisms, and creating hubs, incubators, and accelerators. This support can have a positive economic impact by promoting the growth of digital enterprises and creating jobs in the digital economy. Agyekum *et al.* (2022), as cited by Trinugroho et al. (2022:2), demonstrate that using ICTs by small businesses and SMEs improves their access to external credit facilities, enhancing financial inclusion. This finding aligns with Ayyagari *et al.* (2011), who found that organisational innovation positively impacts access to external financing, particularly bank financing.

Furthermore, Ayyagari *et al.* (2011) states that enabling access to technologies and bridging the digital divide empowers SMEs to connect with markets and opportunities, expanding their customer base and attracting potential investors or securing financing for growth. This increased connectivity and digital presence can open doors for SMEs, facilitating their access to external financing options and resources. By leveraging technology and overcoming barriers to the digital divide, SMEs can enhance their visibility, expand their customer base, and gain the necessary exposure to attract potential investors or secure financing for growth and development. Digital technology also has a significant association with job creation. According to Ndung'u (2018:13), it is estimated that for every additional technology job created, approximately five new jobs are generated in local non-tradable sectors. To promote the formalisation, growth, and job creation of micro, small, and medium enterprises, various interventions are implemented. These interventions encompass a range of support measures such as financial services, access to credit, entrepreneurship training, and business support services. The digitisation of these interventions provides a platform for their success.

However, of greater significance, digitisation has been found to contribute to the emergence of sustainable business models that have a significant impact on the economy. These models operate in critical sectors that directly affect the livelihoods of households. They not only generate economic growth but also ensure long-term sustainability. According to The World Bank Group (2016), technology replaces regular occupations while enhancing higher skill sets, potentially driving workers to compete for low-paying jobs. For instance, the use of Internet banking services and e-commerce platforms may result in the termination of some employees, especially in the banking sector. According to Arntz *et al.* (2016), the likelihood of digitisation causing widespread job losses is low. Their research reveals that, on average, only 9 per cent of jobs across 21 OECD countries are susceptible to automation (Arntz *et al.*, 2016). This suggests that the perceived threat of technological advancements leading to significant job destruction is less important than previously thought. Digital inclusion enables SMEs access to digital resources and opportunities, supports the growth of digital enterprises, enhances

financial inclusion for SMEs, and creates new jobs in the digital economy (Kucukaydin & Tisdell, 2008). While digitisation may lead to job losses in specific sectors, the overall impact on job creation is expected to be positive.

#### 2.1.4.2 Bridging the Digital Divide: Business and Economic Growth Implications

Researchers emphasise that bridging the digital divide can have positive implications beyond economic impact, particularly in terms of job creation and fostering entrepreneurship. The advantages of closing this gap extend to businesses as well, as it can lead to enhanced productivity, improved access to online markets, and increased utilisation of e-commerce platforms. By narrowing the divide, businesses will harness digital technologies to streamline operations, expand their customer base, and explore new avenues for growth. This, in turn, fosters efficiency, competitiveness, and innovation within the business ecosystem. A report by AlphaBeta (2017:15) highlights the significance of accessing online markets for countries aspiring to become digital nations. The report emphasises that simply providing universal Internet access or teaching computer skills is insufficient; governments must adopt a range of policy actions to maximise economic gains in the digital era. These actions include attracting talent, creating a favourable environment for technology investors, and implementing a fair and predictable corporate tax system. However, concerns about security and privacy can hinder enterprises and consumers from fully engaging in the digital economy, leading to a lack of trust, as noted by Bukht and Heeks (2018:12). While the digital economy may result in consumers making purchases from overseas websites instead of local ones, it also presents opportunities for businesses in developing countries to access global markets. For example, online labour markets allow workers in developing countries to participate in international service markets, as Lehdonvirta *et al.* (2014:25) discussed. Additionally, the digital economy opens doors for SMEs to tap into global markets through e-commerce platforms and other digital channels.

Nevertheless, Rückert *et al.* (2020:1) note that there is limited concrete evidence of a significant productivity boost, despite optimistic claims that digital access and adoption will lead to growth and trigger a fourth industrial revolution. Correani *et al.* (2020), as cited by Yang et al. (2021:38), concur with this view and argue that failures often stem from a disconnect between strategy formulation and implementation. They highlight the need for businesses to conduct thorough due diligence to identify the most suitable technologies that align with their needs. The adoption of digital technologies in various business sectors has propelled the fourth industrial revolution, which was projected to bring disruptive changes to the labour market and increase the demand for highly skilled labour (Forum, 2016). The fourth industrial revolution

aims to computerise manufacturing processes, reduce human errors, enhance manufacturing flexibility, and intensify production (Trenovski *et al.*, 2020:38). High-productivity firms with advanced capabilities are well-positioned to benefit from the new technologies of the industrial revolution (Kazmina *et al.*, 2020:11). As a result, macroeconomic benefits, such as rapid output and productivity growth, along with low inflation, are expected (Allen, 2017). These technologies are considered ground-breaking innovations that have far-reaching effects on various aspects of economic activity, thanks to their enormous computing capabilities and real-time information processing (Venturini, 2022:1). Humphreys (2020:122) suggests that the impact of the fourth industrial revolution may be more significant in smaller, flexible, automated mines that exploit variability and have lower social and environmental footprints, compared to large existing mines with fixed capital and footprints. Technological breakthroughs may also occur in mineral grain disintegration, energy-efficient fragmentation through innovative blasting techniques, and bulk sorting to minimise waste in the production process. This implies that the impact of digital inclusion and digital technologies on businesses differs slightly from their impact on societies and individuals.

### 2.1.5 Digital Inclusion and Educational Opportunities

Abdoullaev (2011) and Scholl and Scholl (2014) emphasise that skills and knowledge communities are crucial in driving innovation in the digital and smart era. These communities contribute essential intellectual capabilities that facilitate innovation and advancement. Pan *et al.* (2011) discovered that individuals with higher levels of education, income, and occupational prestige not only have higher rates of Internet adoption and usage but also utilise the Internet for activities that enhance their status and wealth. This suggests that Internet access not only has economic and entrepreneurial benefits but also provides educational opportunities for those who can access it. However, it is essential to consider the impact of Internet use on personal development and skills. Scheerder *et al.* (2019:294) mention that Internet use can affect various skills, such as language proficiency, communication skills, and mental arithmetic.

In terms of education, blended learning has shown potential benefits for both disabled and non-disabled students. There is a scarcity of comprehensive and rigorous research examining the impact of blended learning on students with special educational needs. Nonetheless, existing studies indicate that blended learning has the potential to facilitate the development of valuable time management skills among these students, enabling them to enhance their capacity for independently completing and submitting assignments within specified deadlines (Fitzpatrick & Trninic, 2023:207). Additionally, Rivera (2017) has provided evidence to support the notion that online supplementary resources can effectively improve cognitive

comprehension among students with additional educational requirements. This finding holds significant relevance, especially for young individuals with intellectual disabilities, who often encounter obstacles due to the limited availability of fully accessible educational options. Such limitations adversely affect their educational progress and hinder the development of necessary skills (Fitzpatrick & Trninic, 2023:207). To tackle challenges in instruction, approaches such as implementing class-wide peer tutoring have demonstrated positive outcomes for students with intellectual disabilities (Al Hazmi & Ahmad, 2018).

It is worth noting that the provision of equal access to digital learning remains a challenge for public schools. Without concerted state-wide policies, many schools have struggled to ensure equitable access to digital resources and opportunities, thus failing to fulfil their mission of providing education for all (Robinson *et al.*, 2020:252). To overcome this, nationally scaled digital inclusion programs have proven effective, particularly in smaller populations with higher education levels, stable political environments, and collaborative government structures (Robinson *et al.*, 2020:253). These programs play a crucial role in bridging the digital divide and promoting equal educational opportunities for all students.

#### 2.1.5.1 Access to Online Educational Resources

One of the essential skills required to benefit from ICT is digital literacy. The shift towards specialisation, such as digital literacy, indicates that general literacy serves as a prerequisite for bridging the digital divide and ensuring equal access to technology. Virtual learning and skill development programs can play a vital role in narrowing this divide and empowering individuals to maximise the potential of technology. Digital literacy goes beyond simply knowing how to use software or operate digital devices. It encompasses a variety of complex cognitive, social, and emotional skills that are essential for effectively navigating and functioning in a digitally driven environment (Chetty *et al.*, 2018:10). The integration of ICT in higher education has led to the emergence of Open Educational Resources (OER) (Mncube *et al.*, 2021:245). OER (Open Educational Resources) are digitised resources that are freely and openly accessible for educators to use and reuse in teaching and research activities (Todorinova & Wilkinson, 2020). ICT plays a significant role in transforming and modernising educational systems and learning methods, indicating a positive trend in education despite challenges (Froumin & Remorenko, 2020; Fuchs, 2021). OER enables academics and students to access educational materials freely and openly with open licenses for their needs in both formal and informal educational environments (Mncube *et al.*, 2021:247).

OER allows ICT to have the potential to promote social inclusion within the education sector (Amtallah, 2020). For instance, with OER, academics worldwide can share resources, thereby

reducing educational costs (Ochieng & Gyasi, 2021). The adoption of ICTs by educational institutions is crucial for supporting student learning (Chen & Wu, 2020). To conclude, ICT promotes social inclusion by supporting sustainable education through various methods such as e-tutorials, smart campuses, massive open online courses, blended learning environments, technology-enhanced learning, digital badges, and virtual learning environments (González-Zamar *et al.*, 2020).

#### 2.1.5.2 Bridging the Digital Divide in Education

Bridging the digital divide in education presents a complex and multifaceted challenge that demands attention and action from various stakeholders. The COVID-19 pandemic has emphasised the urgency of addressing this divide, as the transition to online learning has exposed the disparities in access to digital tools and resources among students (Dwivedi *et al.*, 2020). An important aspect of bridging the digital divide is recognising the inequities in technology and resource access. It is crucial to understand that addressing the digital divide extends beyond providing access to technology; it also involves tackling the underlying inequities in education and resource availability (Kucukaydin & Tisdell, 2008). Therefore, efforts to bridge this gap should be accompanied by initiatives aimed at enhancing educational opportunities and ensuring equal access to resources for all students.

In addition to technology access, bridging the digital divide requires addressing other factors, including gender inequality. Efforts should also focus on creating an inclusive digital ecosystem that considers the unique needs and experiences of diverse groups (Priyabadini, 2022). One potential solution for bridging the digital divide is the utilisation of spoken dialogue systems, which have been identified as a technology that can help overcome barriers to digital services in developing countries (Olufemi Moses, 2019). Spoken dialogue systems offer an alternative interface for accessing digital services, particularly for individuals with limited literacy or language skills. However, the implementation of such systems should consider the specific contexts and requirements of different regions (Olufemi Moses, 2019).

The support provided by the government is essential in closing the digital divide. For example, the Korean government has implemented initiatives such as free online education systems and training platforms to address the educational requirements of its population (Cheng *et al.*, 2022). To effectively bridge the digital divide, it is essential to consider the distinct needs and challenges of different regions and communities. An ecological model for bridging the digital divide in education considers the broader context and factors that contribute to the divide (Thapa & Sein, 2018). Efforts to bridge the divide should go beyond providing technology access and address the underlying inequities in education and resource availability. Initiatives

should be tailored to the specific needs and challenges of different regions and communities, accompanied by endeavours to create an inclusive digital ecosystem. Governmental support and policies are instrumental in bridging the divide and ensuring equal access to digital resources and opportunities.

### 2.1.6 Digital Inclusion in Societies

This section explores and analyses existing literature on the social aspects of Internet access and the positive outcomes associated with digital technology skills. Specifically, it delves into factors such as access to information, digital literacy, social connectivity, and the empowerment of disadvantaged individuals and communities. By examining these areas, we can gain insights into the broader social implications of Internet access and the potential benefits it brings to diverse communities and individuals facing social challenges. It encompasses factors such as socioeconomic status, geographic location, age, education level, and other demographic characteristics that can create barriers to digital access and skills. Van Deursen and Helsper (2015:32) argue that the digital divide can be categorised into three levels, each with its characteristics. The third-level digital divide differs from the first and second levels as it focuses on insufficient skills that limit success or efficiency in specific online tasks (Van Deursen & Helsper, 2015). By acknowledging and discussing the digital divide, researchers can analyse the unequal distribution of digital resources and opportunities. They can explore the factors that contribute to the divide and assess its impact on individuals, communities, and society. Additionally, understanding the digital divide helps identify strategies and interventions to bridge the gap and promote digital inclusion. These efforts may involve initiatives to improve access to technology, provide digital literacy training, enhance affordability, and address other barriers that perpetuate the divide.

According to Reder (2015:5), in the modern digital era, digital inclusion and digital literacy are linked concepts that carry great significance. Conversely, digital literacy encompasses the abilities, knowledge, and competencies required to effectively navigate and utilise digital technologies (Reder, 2015). It involves the ability to navigate and evaluate digital information, communicate, and collaborate online, and utilise digital tools for various purposes. Both digital inclusion and digital literacy are crucial for individuals to fully participate in today's digital society. They are essential for accessing educational and employment opportunities, engaging in civic activities, and improving overall well-being (Reder, 2015:5). Reder's report emphasises the need for policies and initiatives that promote digital inclusion and improve digital literacy skills among individuals and communities. It highlights the potential benefits of increased digital

inclusion, such as improved outcomes in education, employment, health, civic engagement, and consumer behaviour.

#### 2.1.6.1 Access to Information and Digital Resources

Access to information and digital resources is a critical aspect of modern society, impacting various domains such as education, research, and everyday life. The digital divide, which refers to the gap in access to and utilisation of digital technologies, has been a significant concern in ensuring equitable access to information and digital resources (Wei *et al.*, 2011). This divide can be categorised into three levels: the digital access divide, the digital capability divide, and the digital outcome divide (Wei *et al.*, 2011). The first level, the digital access divide, refers to the inequality in access to information technology (IT) in homes and schools. This divide is influenced by a range of factors, including socioeconomic status (SES), geographical location, and infrastructure availability (Suh *et al.*, 2022). Studies have shown that individuals from lower SES backgrounds are more likely to face barriers to accessing digital resources and information (Suh *et al.*, 2022). The second level, the digital capability divide, focuses on the inequality in the capability to exploit IT arising from the first-level digital divide and other contextual factors. This divide encompasses aspects such as digital skills, knowledge, and confidence in using digital technologies (Wei *et al.*, 2011). Research has highlighted the importance of digital literacy skills in effectively utilising digital resources and information (Oseghale, 2023).

According to Wei *et al.* (2011), the third level, the digital outcome divide, refers to the inequality in outcomes, such as learning and productivity, arising from the second-level digital divide and other contextual factors. Access to digital resources and information plays a crucial role in educational attainment and research productivity (Mohammed, 2010). Open access initiatives, which promote the dissemination and preservation of scientific knowledge, have accelerated the rate of scientific progress (Vrana, 2014). Digital libraries and repositories have become important platforms for accessing and preserving digital information resources (Awamleh & Fakhouri, 2022). However, it is important to ensure that the preservation of digital content includes attention to the information structure, context, and accessibility. Efforts to improve access to information and digital resources should also consider the specific needs and challenges of different regions and communities. The digital divide is not a one-size-fits-all issue, and solutions should be tailored to address the unique circumstances of each context (Baudet *et al.*, 2023). For example, in higher education, the digitalisation of the educational system aims to ensure broad access to information and digital resources, as well as the use of digital technologies in the educational process (Maslennikova *et al.*, 2019). This requires the

optimisation of cognitive modelling and the development of internal instruments of knowledge for students (Maslennikova *et al.*, 2019). Tailoring solutions to address the specific needs of different regions and communities is essential for effectively bridging the divide. By addressing these challenges and promoting equal access to information and digital resources, we can foster a more inclusive and empowered society.

#### 2.1.6.2 Social Connectivity and Empowerment

According to Van Deursen and Helsper (2015:36), Individuals who have access to digital technologies and resources have the advantage of obtaining goods and services at more favourable prices compared to those who lack such access, leading to a digital consumer benefit. Additionally, research examining social outcomes has identified various advantages enjoyed by digitally advantaged individuals, including an expanded range and size of social connections, often referred to as social capital. The use of the Internet enables individuals to acquire diverse social resources. Those who engage more actively and proficiently with digital platforms can leverage social media and online dating sites to expand their social networks, make new friends, find romantic partners, and enhance their overall social interactions. Studies examining the impact of Internet usage on economic outcomes have demonstrated that in societies where Internet access is not evenly distributed, individuals who engage more extensively with the Internet tend to experience higher earnings from employment. Furthermore, initial research indicates that individuals who are more actively involved in Internet activities have a competitive edge in accessing information related to job opportunities. (DiMaggio & Bonikowski, 2008; Kuhn & Mansour, 2014; Van Deursen & Helsper, 2015). High education and income levels are considered indicators of socioeconomic resources, linked to more productive use of the Internet (DiMaggio & Bonikowski, 2008; Pautasso *et al.*, 2011; Van Deursen & Van Dijk, 2015). Other elements, such as a health disadvantage (such as a disability) or a certain employment situation (such as retirement, unemployment, or caregiving), are also typically linked to slower Internet adoption. Internet usage patterns also reflect features of social (infra)structures in addition to the socio-demographic parameters connected to various forms of individual resources. For instance, persons in underprivileged areas typically have less access to reliable Internet connections.

These findings suggest that individuals with greater digital advantages, such as higher education and income levels, tend to reap more benefits from Internet use in terms of consumer advantages, social connections, and economic outcomes (Robinson *et al.*, 2020:253). However, there are also disparities based on socio-demographic factors and geographic location that can create barriers to accessing and utilising digital resources

effectively (Suh *et al.*, 2022). Understanding these factors is important for developing strategies to reduce inequalities and ensure that all individuals have equal opportunities to benefit from Internet access and use.

### 2.1.7 Digital Inclusion in Community Development

Digital inclusion plays a crucial role in community development by ensuring equal access to and utilisation of digital technologies and resources. It encompasses various dimensions, including access to technology, digital literacy, and the ability to effectively use digital resources (Gallardo *et al.*, 2020). Bridging the digital divide and promoting equitable access to digital resources is important for fostering community development. Access to technology is a crucial aspect of digital inclusion. To bridge this divide, efforts should be made to improve access to technology in underserved communities, including disadvantaged areas (Wagg & Simeonova, 2021). Initiatives such as the development of digital disadvantaged policies and the establishment of community anchor institutions can help promote access to technology and bridge the digital divide.

Furthermore, Digital inclusion enhances social inclusion by providing individuals with access to online services, information, and social networks (Reisdorf & Rhinesmith, 2020). Moreover, it strengthens social capital, improves health outcomes, and enhances civic engagement (Gallardo *et al.*, 2020). Gallardo *et al.* (2020) emphasise that it is crucial to ensure that all members of the community can benefit from digital resources and technologies. This requires a comprehensive approach that considers the specific needs and challenges of different communities. Participatory approaches, involving community members in the design and implementation of digital inclusion initiatives, can help tailor these efforts to the unique context of each community (Wagg & Simeonova, 2021). Community anchor institutions, such as libraries and community centres, play a vital role in promoting digital inclusion by providing access to technology, digital literacy training, and support services (Halpin *et al.*, 2013). By promoting digital inclusion, communities can harness the benefits of digital technologies for economic, social, and civic development, ensuring that no one is left behind in the digital age.

#### 2.1.7.1 Impact on Healthcare Services

Digital inclusion has a significant impact on healthcare services, as supported by several scholarly references. It drives economic and infrastructure development, improving access to vital services such as healthcare, education, and agriculture (Kabbiri *et al.*, 2018). Digital inclusion has been shown to enhance people's access to information, particularly for the disadvantaged poor (Kabbiri *et al.*, 2018). Information communication technology (ICT) has a

notable effect on healthcare, contributing to improved global health outcomes and reduced infant mortality rates (Khelfaoui *et al.*, 2022). Therefore, healthcare plans and policies should prioritise digital inclusion (Khelfaoui *et al.*, 2022). The impact of ICT on health outcomes has been highlighted in Asian countries, emphasising the need for policies that promote digital inclusion in healthcare programs (Kovačić *et al.*, 2022). Several studies have confirmed the correlation between ICT and better health outcomes (Kovačić *et al.*, 2022). Internet access has also been found to improve health frameworks and global health (Khelfaoui *et al.*, 2022).

Equitable, meaningful, and safe access to digital technologies and services is crucial in healthcare (Heaslip & Holley, 2023). During the COVID-19 pandemic, there was increased use of technology for healthcare among older adults with intellectual disabilities, highlighting the need for digital inclusion in this population (McCausland *et al.*, 2022). However, digital poverty, literacy, and exclusion remained significant issues, resulting in reductions in support services and related outcomes (McCausland *et al.*, 2022). Advancements in digital healthcare contribute to the enhancement of healthcare services and patient well-being within the broader landscape of digital transformation (Alessa *et al.*, 2018; Mattingly *et al.*, 2017). However, ethical concerns have been raised regarding the potential for new technologies to exacerbate healthcare disparities based on social, economic, racial, or ethnic characteristics (Bellini *et al.*, 2023). To ensure equity in clinical trial recruitment, digital inclusion is essential, with the use of digital tools and support such as digital navigators (Plombon *et al.*, 2023). Remote clinical trials enable individuals with mobility issues or living in remote disadvantaged areas to actively participate, enhancing inclusivity (Plombon *et al.*, 2023). However, it is important to address the potential disparities between those who have digital skills and access to tools and those who do not, as this may contribute to existing health disparities (Sieck *et al.*, 2021).

In conclusion, digital inclusion has a significant impact on healthcare services, improving access, health outcomes, and equity. Efforts should be made to promote digital inclusion in healthcare policies, ensuring that all individuals, including marginalised groups, have access to digital technologies and services for better healthcare outcomes and overall well-being.

#### 2.1.7.2 Bridging E-Government Divides in Developing Nations

In the context of government, social exclusion caused by unequal access to the Internet poses a significant cultural barrier to e-government in developing countries (Dodel & Aguirre, 2018). Digital skills and competencies have become increasingly significant factors in shaping disparities, with certain minority groups being marginalised due to their lack of effective interaction with online government services (Yu *et al.*, 2017). Digital skills are crucial factors that shape how individuals engage with online services and the effect of the digital divide on

e-government. (Ebbers *et al.*, 2016). Vulnerable or low-income groups, who have limited access to and lack skills in using technology, are more likely to be marginalised. This creates a paradox where the very groups that government organisations aim to assist are often the ones facing the highest levels of exclusion (Esteban-Navarro *et al.*, 2020).

Furthermore, in remote or disadvantaged areas, the digital divide exacerbates inequalities due to low ICT literacy, limited infrastructure access to technology, and lack of awareness, affecting the demand for e-government services (Maredia *et al.*, 2018). This emphasises the importance of e-government training programs and the significance of digital inclusion in the context of e-government services (Chohan & Hu, 2022). The effectiveness of e-government programs depends on nurturing citizens with ICT skills, as public investments in these services prove to be cost-effective when citizens actively participate in the programs (Chohan & Hu, 2022). Ensuring public services are accessible to every citizen aligns with the United Nations' goal of leaving no one behind, emphasising the importance of e-government ICT training programs to develop ICT skills and promote digital inclusion United (Nations, 2018). ICT's quick development has prompted technological service developments in the public sector via the Internet, highlighting the importance of e-government ICT training programmes for bridging the digital divide and fostering digital inclusion (Chohan & Hu, 2022).

Civil society organisations play an essential role in facilitating citizens' access to and utilisation of ICT services, thereby promoting the advancement of digital societies and fostering active civic participation (Chohan & Hu, 2022). Their involvement can further enhance digital inclusion efforts and bridge the gap between government services and marginalised groups. The cultural barriers to e-government in developing countries include social exclusion caused by unequal access to the Internet. In developed countries, disparities in digital skills and competencies have become critical factors affecting access and opportunities in e-government services. The lack of digital skills among certain minority groups, as well as the digital divide in remote or disadvantaged communities, contribute to social inequalities. E-government ICT training programs and the involvement of civil society organisations are important in promoting digital inclusion, reducing the digital divide, and fostering civic engagement in digital societies.

#### 2.1.7.3 Digital Inclusion: Empowering Civic Engagement in the Digital Age

This section examines the correlation between digital inclusion and civic engagement, highlighting the significance of digital inclusion in facilitating individuals' involvement in political endeavours and enhancing democratic governance (Mihailidis & Thevenin, 2013). According to Boulianne (2009), as cited by Gu (2021:8), the widespread adoption of social media and other digital platforms has had a beneficial impact on civic engagement, facilitating political

discussions and civic messaging. These associations indicate that the Internet's role in reducing the barriers to citizen engagement, expanding the scope of activities individuals can participate in, and improving the quality of those activities establishes digital inclusion as a catalyst for fostering a more engaged community. Gu (2021) study conducted across 26 OECD countries indicates that policies promoting digital inclusion have a favourable effect on civic engagement, specifically concerning voter turnout. The research underscores the significance of individuals possessing the essential skills, knowledge, and confidence to utilise ICTs for active participation in civic activities effectively. In summary, the results suggest that fostering digital inclusion can play a role in enhancing civic engagement and bolstering democratic processes (Mihailidis & Thevenin, 2013).

Furthermore, studies have shown that social media usage positively influences civic engagement by enabling knowledge sharing, active participation in community and civic issues, and enhancing democratic values (Heath & Gleason, 2019; Shao *et al.*, 2022). Digital democracy, encompassing the use of digital technologies to promote democratic values, enhance governance processes, and support greater citizen participation, is an important aspect of digital inclusion and civic engagement (Dunne, 2019; Sala, 2022). The proliferation of social media and other digital services has provided avenues for political discussions and civic messaging, contributing to increased civic engagement. Social media usage and digital technologies have the potential to enhance democratic values, knowledge sharing, and active participation in community and civic issues. Promoting digital inclusion and digital literacy programs can contribute to fostering civic engagement and creating a more inclusive and participatory society.

## 2.2 Conclusion

This chapter emphasises the importance of actively involving disadvantaged communities in South Africa, Africa, and the world at large in addressing the challenges of Internet connectivity and bridging the digital divide. It argues that the formulation of digital divide policies should not solely rely on the expertise of a select few individuals but should instead embrace a collaborative approach that includes the participation and input of societal communities. The chapter highlights the significance of including disadvantaged communities in shaping the agenda and decision-making processes from the outset. By going beyond economic and political arguments, the dialogue surrounding digital connections should encompass the unique needs, aspirations, and perspectives of these communities. Through open and inclusive discussions, stakeholders can contribute their insights, experiences, and concerns, ensuring that resulting strategies and implementation plans truly reflect the diverse voices and

interests involved. Moreover, actively involving disadvantaged communities in policy formulation and implementation allows the South African government to gain a comprehensive understanding of the challenges they face. By tailoring solutions to their specific needs, a more holistic and contextually relevant approach can be adopted. This approach fosters a sense of ownership and participation, increasing the likelihood that communities will effectively embrace and utilise digital infrastructure, leading to long-term sustainability and success.

The chapter concludes by emphasising the necessity of an all-inclusive and participatory approach in designing effective strategies to bridge the digital divide in disadvantaged communities. By engaging these communities as active partners and incorporating their perspectives, the government can create policies and plans that address their unique challenges and aspirations. This approach not only maximises the impact of digital infrastructure but also fosters a sense of ownership and empowerment, laying the foundation for sustainable development and inclusive growth. In summary, this chapter advocates for the active involvement of disadvantaged communities in the process of bridging the digital divide. It underscores the importance of inclusive dialogue, tailored solutions, and participatory approaches to ensure the successful integration of these communities into the digital landscape. By doing so, governments and policymakers can foster an environment that promotes digital inclusion and empowers disadvantaged communities to thrive in the digital era.

This chapter highlighted the negative implications of the digital divide on social, educational, and economic prospects around the world. Disparities are made worse by the lack of Internet access, especially during the pandemic, especially in rural regions and among young people. The chapter further promotes focusing on digital inclusion rather than the divide itself. It encourages a thorough grasp of digital inclusion and emphasises the potential for transformation it has in a variety of sectors.

# CHAPTER 3 RESEARCH METHODOLOGY AND ANALYSIS

## 3.1 Research Methodology

The literature review in Chapter 2 provided an overview of the Digital Divide, Digital Inclusion, and the potential social and economic benefits for people in lower to middle-LSM status who live in disadvantaged communities. This chapter provides a brief overview of the research methodology, procedures, and guideline values utilised to collect the necessary data from the sample of people in Kagiso, Simunye, and Bekkersdal, to answer the study's objectives as stated on page 8. The primary objective is to assess the changes in social and economic outcomes resulting from the deployment of affordable, uncapped fibre-based Internet. This will be achieved by comparing data collected before and after the Internet's deployment. Additionally, the study aims to explore the digital divide and digital inclusion aspects to identify the disparities due to the digital divide and propose digital inclusive initiatives to bridge this gap.

The research methodology is the general method used during the research study to investigate a specific problem (Collis & Hussey, 2014). A quantitative research approach was chosen to gather detailed location throughput data, paired with participant Internet plan information and their perceptions of the Internet. This method was preferred to create a comprehensive dataset that currently does not exist for this area. The survey aimed to provide context regarding fibre Internet and its perceived impact on the quality of life in disadvantaged communities. This chapter will delve into the data collection process and the subsequent data analysis.

## 3.2 Research Design

Research design is an architectural plan that links all the steps to ensure that the procedure is carried out with the essential rigour that leads to decisive conclusions and recommendations favoured in the research (Bickman & Rog, 2008). There are many alternatives available to researchers, and it is necessary to select the best options. Research design is a method used for determining specific research (Bhero, 2013). The study is based on the research design described by Saunders *et al.* (2007). This study followed a research onion approach, using the quantitative positivism paradigm method, the deduction approach, the census survey strategy, and a method of prospective sampling to collect data.

Saunders *et al.* (2012) pointed out that the use of research onion must start from the outer layer rather than from the inner layer. Saunders *et al.* (2007) claim that when one looks at onions from the outside, each layer of the onion describes a detailed level of the research

process. The author argues that to see the inner layer, the outer layer must be first deformed, decomposing each layer of a layer of onion layer by layer. To reach the goal, the proper steps should be taken; therefore, this applies to research, which first completes a step before moving on to the next step (Emmanuel, 2019).

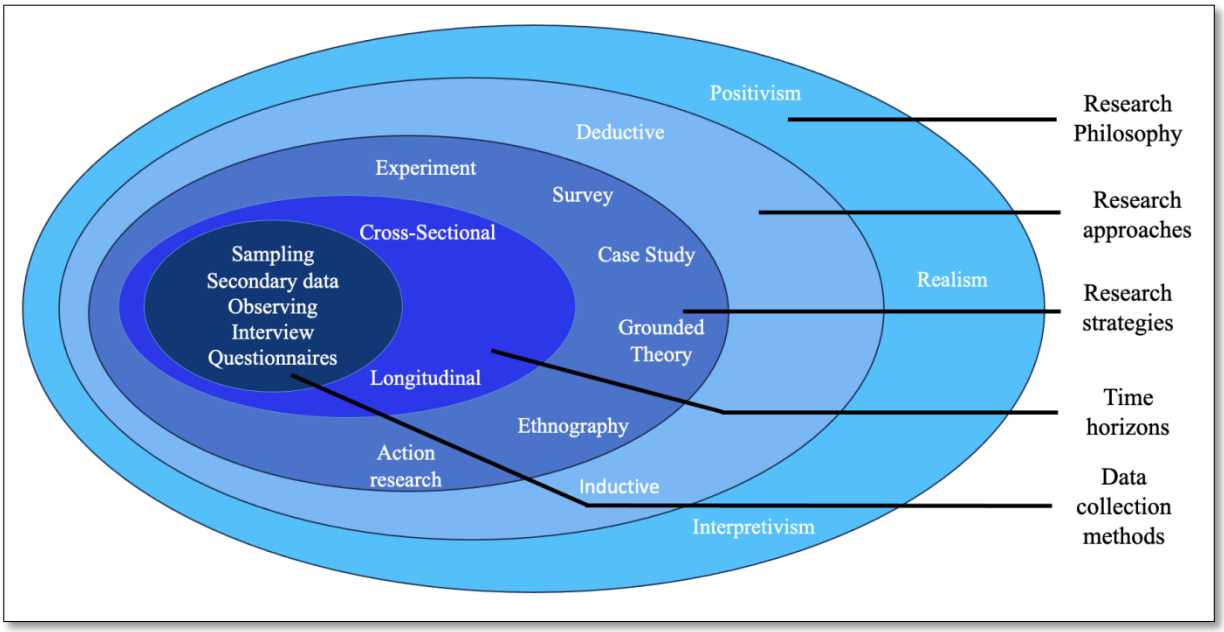


**Figure 3- 1: Research Onion**

**Source: Saunders, 2007**

In Figure 3- 1the research onion developed by Saunders *et al.* (2007) describes the stages that researchers need to take in the development of practical methodologies. The research onion is an extension of the research method tree.

## 3.3 Research Paradigm

According to Guba and Lincoln (1994), research paradigms provide a framework for expressing a set of limits and worldviews influencing research. A worldview is a paradigm, concept, or belief system that guides people's beliefs and activities. (Creswell & Creswell, 2017). Research methodology is part of the paradigm that establishes the rules and standards used in research studies (Creswell & Poth, 2016). Positivism and interpretation are the study paradigm's significant philosophical worldviews (Creswell & Creswell, 2017). The positivist method is quantitative, widely called the scientific method, and the interpretation method is the qualitative method. "Positivism represents a perspective tailored for traditional scientific studies, traditionally developed to explore probable phenomena (Obinkyereh, 2017).

### 3.3.1 Positivism Paradigm

The study is positivistic due to its nature and provides reasons and forecasts as contributions and facts that can be observed and quantified. The aim is to obtain detailed information to gain a better understanding of the subject under investigation and to develop theories (Alharahsheh & Pius, 2020:41). This paradigm assumes objectivity and seeks to minimise the researcher's influence by emphasising factual evidence and employing logic and reasoning to ensure precision during the analysis of correlations between variables (Rahman, 2023:3). The research involved the collection and analysis of quantitative data utilising advanced statistical techniques such as SPSS (Statistical Package for Social Sciences) to test the hypothesised relationship between the dependent variable and the independent variable.

A quantitative approach is summative, which helps researchers to determine or observe things about a phenomenon scientifically or mathematically. Researchers use quantitative research methods to identify problems or challenges and establish a relationship between variables researchers use, such as observations and measurements, to investigate phenomena to find social aspects (Creswell & Creswell, 2017). Quantitative research begins with an idea or theory, information collected by surveys and analysis of data supporting, rejecting, or refuting the theory (Obinkyereh, 2017).

### 3.3.2 Interpretive Paradigm

Interpretive paradigms are worldviews based on the idea that people have subjective meanings of factors and that each character thinks differently (Creswell & Poth, 2016; Seedhouse, 2005). Creswell and Poth (2016) argue that the interpretation paradigm is a comment on behaviour rather than a dimension of scientific theory. Interpretive research, also known as constructivism, is based mainly on the idea that it is not possible to show or refute a hypothesis, but that it is more effective to become aware of, discover and explain factors in a particular social position (Ghauri *et al.*, 2020). The paradigm of interpretation studies uses a qualitative research method. Although positivism is recognised for its generality and objectivity, it cannot be directly used as a concept in social science (Bhero, 2013). A business environment consists of variables that may be too complex to be adapted to specific theory guidelines of the physical sciences (Saunders *et al.*, 2007). If the mechanical guidelines of positivism were used with caution, the insights hidden in the complexity of the phenomenon would be lost (Bhero, 2013). Furthermore, the business and management research encounters situations and individual behaviours that are unique to a real environment. This effect pattern applies only to this setting and can be extended as soon as the instance changes. This immediately drew doubt about the generality of interpretation/phenomenological studies, which may not

follow a fixed law but may be subject to the peculiarities or characteristics of an ever-changing business industry (Bhero, 2013).

This study adopted a quantitative approach associated with the ideal positivist paradigm for this study.

## 3.4 Research Approach

### 3.4.1 Deductive Approach

The deductive methodology is based on a logical line of thinking and starts with a set of evidence or hypotheses to solve the research question. Deductive arguments are invoked when starting with a theory, a hypothesis derived from the concept is empirically investigated with the use of statistics to demonstrate the connection with the established concept (Bhero, 2013). This study is conducted in a deductive approach.

### 3.4.2 Inductive Approach

The aim of research studies is to add knowledge using inductive or deductive logic. Inductive logic begins with observation and develops a new theory (Kammerlander & De Massis, 2020). This method includes "theory-building", i.e., information gathering to create concepts that explain the relationship between factors and allow research to develop new knowledge (Bhero, 2013:45). However, Bhero (2013), citing Malik (2012), argues that the new theory does not give a 100% guarantee of the facts found, but confirms the probability in the truth. The following

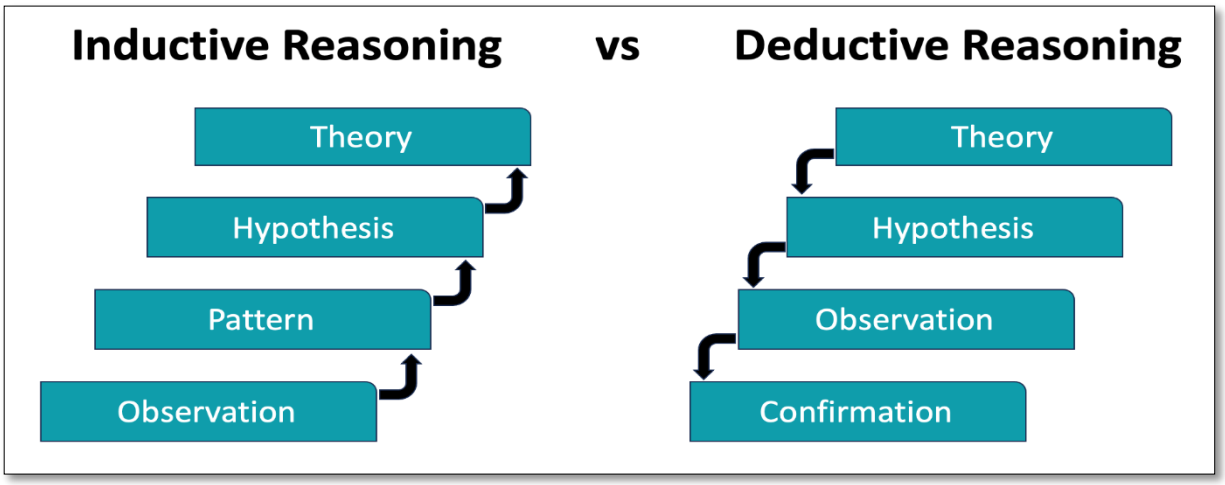


Figure 3- 2: Illustration Summarising Inductive vs. Deductive Reasoning

Figure 3- 2 summarises the key differences between the inductive and deductive approach, the main difference between inductive reasoning and deductive reasoning is that the aim of inductive reasoning is to develop a theory and the aim of deductive reasoning is to test an existing theory or hypothesis.

## 3.5 Research Procedure

This study employs deductive reasoning, a process in which the conclusion is logically derived from a set of premises, and the conclusion is valid only when all the premises are true (Ketokivi & Mantere, 2010:315). The set of premises that this study aims to establish is that the individuals residing in these lower to middle LSMs will experience adverse social and economic consequences unless affordable Internet access is made available in their households.

A questionnaire was designed to gather and analyse data from respondents. Approval was obtained from the EMS-REC Scientific and Ethics committees. The survey was sent out to participants through the company's email database within the relevant communities being studied. The email to participants included a cover letter outlining the study's goals, ethical considerations, and instructions for completing the questionnaire. Participants accessed the online survey using a provided link through Google's survey tool.

Prior to proceeding, respondents had to provide written consent on the first page of the questionnaire, agreeing to the study's terms. In cases where email contact was not feasible, alternative methods like phone calls were used to reach participants. The aim was to investigate the socio-economic impact of deploying affordable and uncapped fibre-based Internet in lower to middle-LSM communities in Gauteng and to determine whether the impact of uncapped fibre Internet was positive or negative and if it led to an improvement in the quality of life. The data was distributed to 500 existing users with access to uncapped fibre Internet in Kagiso, Bekkersdal, and Simunye, all located in the West Rand region of Gauteng.

## 3.6 Data Collection

### 3.6.1 Population and Sampling

A population is a set of components or cases in a standard set to be studied Bhero (2013). In some cases, the population is small enough and measurable to produce useful results (Saunders *et al.*, 2012). In other words, in some cases, a population cannot be addressed. For example, populations may be too large, or it may be costly to study the entire population or time constraints may not allow for results to be required quickly (Saunders *et al.*, 2012). In

such cases, samples can be used as an alternative if the sample is chosen; sampling errors should be reduced to represent the population Bhero (2013).

The research will focus on individuals residing in the Kagiso, Bekkersdal and Simunye communities who have subscribed to the organisation's affordable fibre-based Internet service. Participant data, already recorded and stored in the organisation's database, will be utilised as part of the research sample. This population comprises individuals who have gained Internet access through this initiative. Participants will be contacted via email.

Most households in this group have specific characteristics: they include employed individuals, self-employed individuals, pensioners, and some unemployed family members. These households are situated in adequately structured homes, with some family members possessing computer literacy and high school education. They either use or have family members who utilise the affordably priced unlimited Internet fibre, which serves various purposes, such as social, professional, commercial, or educational activities online.

Previously, this population used non-customized, capped, and throttled Internet packages from other Internet Service Providers (ISPs) that were not tailored to their specific needs. The total population that received Internet is around the figure of one thousand eight hundred (1800) users.

### 3.6.2 Sampling Technique

According to Maree (2007), as cited by Mather (2021), suggests that due to time and cost constraints, it's rare to study an entire population. Instead, researchers typically select a reasonable number of participants from the population under investigation (Blanche *et al.*, 2006). The chosen sample should ideally represent the entire population (Koranteng, 2012). The term "research population" doesn't always pertain to humans; it can include any collective phenomenon chosen as the focus of study, whether it's people, objects, environments, behaviours, or social processes (Goddard & Melville, 2005). According to Maree (2007), there are two main sampling methods: probability and non-opportunity sampling.

#### 3.6.2.1 Non-probability Sampling

Non-probability sampling involves selecting members from a population without the researcher knowing the exact number and location of the population (Babbie & Mouton, 2001). For instance, this method can be used for sampling homeless people (Koranteng, 2012). Unlike probability sampling, individual participants in the population do not have an equal chance of being selected, and random sampling methods are not employed (Maree 2007). Non-

probability sampling is chosen when access to the entire population is not feasible, making it suitable for qualitative studies that require an in-depth approach. However, in this research, non-probability sampling is not selected due to the study's quantitative nature.

#### 3.6.2.2 Probability Sampling

Babbie and Mouton (2001) define probability sampling as a method where a specific number of participants is chosen from a known and available population, with the goal of accurately representing the population's parameters. This method involves random selection, ensuring that every individual in the population has an equal chance of being included in the sample. According to Creswell and Poth (2016), this approach enables the generalisation of findings to the entire population, making it suitable for quantitative studies. In this study, the advantages of probability sampling will be explored, and specifically, the research will employ stratified sampling from the various options available under probability sampling methods.

### 3.6.3 Stratified Sampling

This study employed a stratified sampling method, where the entire population was divided into smaller groups based on shared characteristics like age, occupation, and location. This approach aimed to reduce potential human bias in selecting participants. The research focused on communities where affordable fibre-based Internet was provided, and participants were drawn from Kagiso, Bekkersdal, and Simunye. Data from individuals who gained Internet access through this initiative, including those employed, self-employed, pensioners, or unemployed family members, was collected from the organisation's database. The study utilised information from all willing participants, ensuring representation from diverse subgroups. Simple random samples were taken from each stratum, and the findings were combined and weighted for statistical accuracy. Participants were categorised by location, age, gender, education level, and employment status. By including all available data, the study aimed to create a fully informed business case reflecting the entire population. A Google Forms tool was used to organise the data into strata, enabling in-depth subgroup analysis for the researcher.

## 3.7 Survey Strategy

According to Saunders et al. (2007), a survey strategy is typically associated with the deductive approach and is a highly efficient and cost-effective method for researchers to collect valuable and reliable information. Surveys are commonly used in quantitative research and involve sampling a representative portion of the population (Bryman & Bell 2011). This method

examines the relationships between various variables, assisting researchers in gathering pertinent information and addressing their research questions.

Descriptive surveys, as defined by Galloway (2003), pertain to specific research questions, design, and data analysis methods applied to a particular subject. These studies are carefully planned and structured, allowing collected data to be statistically inferred to a larger population (Ethridge 2004). The primary goal of descriptive surveys is to understand the opinions, behaviours, or attitudes of people by collecting information from individuals or groups on a specific subject (Bonde 2018). Due to its convenience and advantages, the descriptive survey method was deemed ideal for this study, and thus, this approach was followed.

### 3.7.1 Survey Questionnaire

In the study, a survey questionnaire comprising four sections and a cover page requesting consent was utilised. To ensure objectivity and applicability to a larger population, the researcher employed primary research methods, specifically surveys and questionnaires, to analyse the data. Participants received the questionnaires via their email addresses, following the guidelines of the POPI Act No. 4 of 2013 (RSA_POPI_ACT, 2013). Before completing the questionnaire, participants were required to provide consent through an Informed Consent Form. This form included details such as the study title, researcher and supervisor names and contact information, study objectives, and participant expectations.

The questionnaire included demographic information in Section A, encompassing variables like gender, age group, education level, occupation, and income. To ensure a comprehensive analysis of these variables, the questionnaire consisted of structured, closed-ended questions.

### 3.7.2 Demographics in Survey

Researchers often collect demographic information to describe the participants in their studies, a practice noted by Connelly (2013). Demography, as a field of study, involves analysing quantifiable data about a particular population, aiding in the identification and characterisation of population subsets at a specific moment (Vogt & Johnson, 2011, (Connelly, 2013). Common demographic factors include gender, age, education level, employment status, and other relevant characteristics pertinent to the study's context (Connelly, 2013). In the context of this study, demographic questions were incorporated into the research process. This inclusion aimed to comprehend the characteristics of the population under investigation and gather pertinent demographic data, aligning with established research practices.

### 3.7.3 Research Participants

The unit of analysis is a well-defined set of people or things that are acknowledged to have characteristics in common; these people or things typically have a characteristic in common that unifies them (Trevino *et al.*, 2020). A sample containing the data needed by the researcher must be picked from the population, which may be thought of as a universe of objects or units (Bryman *et al.*, 2014:381).

For the purposes of this study, the population might be regarded as the Lower to Middle-LSM individuals in the west rand areas of Gauteng that are stated in Chapter 1.

## 3.8 Data Analysis

The data collected from the respondents was compiled and analysed using Statistical Product and Service Solutions (SPSS) Version 28.0.0.1(14). The analysis included both descriptive and inferential methods. Descriptive analysis was employed to calculate the percentages and frequencies within the demographic context, allowing for an understanding of the overall population characteristics. Mean and standard deviation were also determined using this method. Inferential statistics, specifically the t-test, were extensively utilised to explore the research findings, following the approach advocated by Ghavifekr *et al.* (2016). This method enabled a deeper investigation into the relationships and differences within the data, providing valuable insights into the study's outcomes.

### 3.8.1 Statistical Analysis

In this section, the researcher presents the statistical analysis conducted to investigate the research questions and hypotheses outlined in Chapter 1. The analysis aims to provide a comprehensive understanding of the data collected and to test the relationships and patterns identified in the study. The following sections outline the data preparation, descriptive statistics, inferential statistics, and tests used to validate the hypotheses.

#### 3.8.1.1 Descriptive Statistics

Descriptive statistics were employed to provide an overview of the dataset and to characterise critical variables. Measures such as mean, median, standard deviation, and frequency distributions were used to summarise the central tendencies and distributions of the variables of interest.

## 3.9 Validity And Reliability

In quantitative research, reliability is defined as the capacity of a measuring tool to consistently produce the same results under the same conditions (Souza *et al.*, 2017:652). It covered the stability and internal consistency of the metric. Stability referred to the belief that the measurement instrument would remain consistent over time, and the results would be consistent if administered again under the same circumstances. The test-retest approach was the simplest to assess stability, involving testing the same sample twice (Souza *et al.*, 2017:650).

Internal consistency, on the other hand, dealt with whether the scale's items consistently served as indicators for the variable dimensions and reflected the intended construct (Clifton, 2020:263). The widely used internal consistency testing approach was the split-half method (Souza *et al.*, 2017:651). In this study, the sample was divided into two groups, and the correlation between the two halves was evaluated. To ensure consistency in dividing the sample, Cronbach's coefficient alpha was used to calculate the average of all split-half options. Generally, an alpha of 0.8 was considered an adequate level of internal consistency (Souza *et al.*, 2017:651). Even though this study used scales for which the reliability had already been established, the reliability of the measuring instrument within the context of the study was evaluated using Cronbach's coefficient alpha to ensure scientific credibility.

Additionally, in quantitative research, validity pertained to the degree to which the selected measuring instrument or the set of indicators it encompassed accurately measured the intended concept (Mohajan, 2017:63). Face validity assessed how well a measure appeared to assess the underlying idea when taken at face value and had been evaluated by consulting a field expert. The construct validity of a scale refers to how well it assesses the primary construct it intends to evaluate (Mohajan, 2017:62).

To demonstrate construct validity, data was gathered from a variety of sources. Evidence had to demonstrate that the scale had convergent validity, meaning that it measured what it was designed to measure and discriminant validity, indicating that it did not measure unexpected or irrelevant qualities. Like Flotman and Grobler (2020:5), the exploratory and confirmatory factor analysis method was used to assess construct validity.

### 3.9.1 Limitations

The researcher was aware of the potential challenge in getting participants to allocate time for responding to the online survey. This was anticipated given the participants' busy schedules,

which could lead them to perceive participation as an extracurricular activity unrelated to their primary commitments, be it employment or schooling. Additionally, a limitation was encountered due to the lack of participation from one of the surveyed townships, the reasons for which remained unknown. Consequently, the data collected from this area might not accurately represent the perceptions of that specific community. However, it's important to note that the primary objective of this study was to provide an overall insight into the impact of affordable fibre Internet on individuals belonging to the lower to middle socioeconomic brackets (LSMs). Despite these limitations, the study aimed to capture the general perception of this demographic regarding the influence of affordable fibre Internet services.

### 3.9.2 Ethical Considerations

Guillemin and Gillam (2004) delineate two dimensions of ethics: procedural ethics and ethics in practice. Procedural ethics, as outlined by Ellis (2007), is mandated by Institutional Review Board (IRB) committees and focuses on aspects like confidentiality, rights to privacy, informed consent, protecting human subjects, and addressing deception in research practices. On the other hand, ethics in practice, as described by Goodwin *et al.* (2003), deals with unpredictable and subtle yet ethically significant moments that arise during the research process.

Ethical standards are paramount in various professions, institutions, and organisations, aligning with their specific objectives and goals. In the realm of research, adherence to ethical standards is crucial. According to Resnik (2011), these standards serve several key purposes, such as promoting truth, knowledge, and the prevention of errors, including falsification of research information. Moreover, ethical standards foster essential qualities for collaborative work, including mutual respect, trust, fairness, and accountability, especially when research involves coordination among individuals from diverse disciplines and organisations.

Ensuring adherence to ethical standards is vital to holding researchers accountable to the public, encompassing areas such as research misconduct, human subjects' rights, conflicts of interest, and animal care, particularly in publicly funded research endeavours. Moreover, these standards play a role in building public support for research initiatives. Institutions and individuals are more likely to invest in research projects when they can trust the quality and integrity of the research being conducted. Ethical standards in research also uphold critical moral and social values, including human rights, health and safety, legal compliance, and social responsibility (Shamoo & Resnik, 2009).

### 3.9.3 Process of Obtaining Informed Consent

This study formed part of a larger study that had already obtained ethical approval **(NWU-00588-23-A4)**. The data were treated confidentially and used solely for the purposes of the study. No names were disclosed, and the data were securely stored for seven years before being destroyed. Participant data were kept confidential, and measures were taken to safeguard the information and prevent any threats to data privacy. Signed consent forms were electronically stored on a server protected by a firewall and password-accessible only to authorised individuals, specifically company managers assigned and approved for the study. All involved were aware of and adhered to the company's data privacy guidelines outlined in the Protection of Personal Information POPI Act No. 4 of 2013 (RSA_POPI_ACT, 2013). Confidentiality agreements were signed by approved managers and the researcher to protect participant and company information.

In addressing ethical concerns and definitions, the study took several measures. First, permission was obtained from the Internet Service Provider (ISP) to access user information by contacting users. Participation in the study was completely voluntary, allowing participants the freedom to join or withdraw at their discretion. Before participating, informed consent was obtained, ensuring participants fully comprehended the study's objectives, advantages, and potential risks.

Participants were informed about the study's purpose, associated risks and benefits, and the anticipated duration. Contact information for both the company and North-West University's ethical conduct approval number was provided to ensure transparency. The study underscored the importance of privacy, allowing participants to withdraw from the survey or request to remove their information by contacting the researcher or the company at any point.

During the survey, participants encountered an informed consent page, necessitating them to read and acknowledge it before proceeding. While demographic information like age, gender, nationality, and ethnicity was collected, this data was pseudonymised to guarantee anonymity and confidentiality. Only participant pseudonym numbers could link survey data to personally identifying information.

To ensure transparency, prevent bias, and mitigate any potential scrutiny, the information collected was reviewed not only by the researchers but also by an independent supervisor. The participant consent letter and invitation letter are included in the study documents (Annexures B and C), providing a record of the communication and consent process.

### 3.9.4 Process of Invitation to Participate

The invitation letter served as a formal request for all respondents to participate in the online survey and is documented in Annexure C. This method of invitation has been found effective in encouraging respondents to engage in online surveys, as evidenced by Petrovčič et al. (2016). Each respondent received a consent form, which is detailed in Annexure A.

Seeking consent is an integral part of ethical approval, enabling respondents to make an informed decision regarding their participation in an online survey (Roberts & Allen, 2015). The consent letter was strategically placed in the first section of the survey, allowing respondents to read, comprehend, and either accept or decline their participation. Respondents could proceed with the survey only after clicking the "I AGREE" checkbox, indicating their agreement with the terms outlined in the consent form. Roberts and Allen (2015) recommend this approach, emphasising the importance of presenting the consent form before respondents access the survey questionnaire. This procedure ensured that respondents had ample time to understand the process and willingly agreed to the terms before participating. (Refer to ANNEXURE A for the Informed Consent Form).

### 3.9.5 Privacy, Anonymity, and Confidentiality

Cohen *et al.* (2007) emphasise the importance of respecting respondents' "right to privacy" and ensuring "anonymity," as these rights are vulnerable to violations in research studies. Similarly, Kumar (2005) suggests that participants should be fully informed about the study's objectives, procedures, as well as its advantages and disadvantages. After data collection, researchers bear the responsibility of safeguarding this information, preventing access to anyone beyond the scope of the study (Fraenkel *et al.,* 2012).

In alignment with these ethical principles, the online survey implemented stringent measures to maintain participants' anonymity and confidentiality. Specifically, the survey did not include any questions that could link respondents to the study, thereby ensuring their anonymity. Additionally, access to the questionnaire and the collected information was restricted. It is crucial to note that this study was conducted solely for academic purposes, emphasising the protection of respondents' rights to privacy, anonymity, and confidentiality throughout the research process.

To preserve anonymity, the researcher remained unaware of participants' identities, and no personally identifiable information was collected. Each participant was assigned a unique two

to three-digit number for data pseudonymisation, ensuring personal details were excluded from the study.

### 3.10 Conclusions

The third chapter addressed the research methods employed in this study, the population of this study, and the questionnaire used to survey the population. The third chapter discussed the research paradigm, research protocol, population size, sampling strategy, and ethical considerations. The following chapters will show the data collected and analysed, as well as the interpretation, recommendations, and conclusion.

# CHAPTER 4 RESULTS AND DISCUSSIONS

## 4.1 Introduction

This chapter presents the analysis of the results from the self-reported adherence questionnaire and the data collection tool (Annexure B) containing the socioeconomic impact outcomes from the specified areas in Chapter 1.

By comparing the data gathered from (Kagiso, Simunye, and Bekkersdal townships), the main goal is to ascertain the difference in social and economic consequences before and after the introduction of affordable uncapped fibre-based Internet.

This study seeks to investigate the current state of digital access and usage in these communities and to identify the problems they encounter with the Internet through its secondary objectives. The health, education, job, and business possibilities will be evaluated, and any gaps in digital skills will be identified. The effectiveness of digital programmes and government participation initiatives to fill these gaps will also be evaluated.

The results of the structured, closed-ended questionnaire that the participants—who are the recipients of the company's affordable fibre Internet—were provided are covered in this chapter. The questions following Section B, which gathers demographic data, assesses the current economic position or state as it was before the Internet was deployed. The following section, section C, aims to evaluate how those communities perceive the impact of the affordable fibre-based Internet after the fibre Internet was deployed. The difficulties these communities face will be highlighted to assess the socioeconomic impact, whether it has advantages or unfavourable.

The specific objectives of this study were:

- To examine the current level of digital access and usage in Kagiso, Bekkersdal, and Simunye townships, identifying challenges faced by residents in Internet access.
- To evaluate the impact of affordable fibre-based Internet on education, employment, and business opportunities within these communities.
- To investigate the effects of affordable fibre-based Internet on the health and well-being of residents in the aforementioned townships.

- To identify gaps in digital skills in communities and assess the effectiveness of digital literacy programs and government initiatives in addressing these gaps.

Table 4- 1 provides an overview of the format for the presentation of results in accordance with the above empirical objectives.

**Table 4- 1: Presentation of the results according to objectives**

| Applicable Section in the Chapter | Objective | The data collection tool used |
|---|---|---|
| **Digital Disparities and Societal Impact: A Global Perspective** | Determine the change in social and economic outcomes. | Questionnaire:<br><br>Questions 17 to 28 |
| **Navigating the Complexities: South Africa's Multifaceted Digital Divide** | To assess the current level of digital access and usage in these communities and identify the challenges faced by residents in accessing the Internet. | Questionnaire:<br><br>Questions 6 to 16 |
| **Digital Inclusion and educational opportunities** | To assess the impact of affordable fibre-based Internet on education, employment, and business opportunities within the communities. | Questionnaire:<br><br>Questions 6 to 11 and 17 to 22 |
| **Creating an Inclusive Digital Society in South Africa** | To identify any digital skills gaps in the communities being studied and determine the effectiveness of digital programs and government involvement to close these gaps | Questionnaire:<br><br>Question 3 |

## 4.2 Demographics

### 4.2.1 Demographic Characteristics of the Study Population

Demographic details of the participants were gathered from Section A of the self-reported adherence questionnaire (Annexure B), including age, gender, education, occupation, computer skill and township. These details are presented in Figure 4- 1.

Economic data, such as the participant’s subscribed fibre package, household size, monthly spending, and household income before fibre installation, were collected from Section B of the questionnaire (Annexure B). These economic details are displayed in Figure 4- 2.

The study's Section C presents participants' perceived economic and social impact information before uncapped fibre installation, rated on a scale from 1 to 5, where 1 signifies "Strongly Disagree", and 5 represents "Strongly Agree." These social and economic perceptions are outlined in Figures 4- 5.

Similarly, Section D of the study displays participants' perceived economic and social impact information after uncapped fibre installation, rated on the same scale. These post-installation social and economic perceptions are depicted in Figures 4- 7.

### 4.2.2 Participants' Response Rate

In the previous chapters, it was noted that the survey was made available to all possible participants using the company's email system while leveraging the customer database. The questionnaire was closed before receiving the required sample size of 317 respondents; however, it was closed due to time restrictions. 135 of the 317 targeted respondents successfully finished the survey online, while 4 opted out and were directed to the survey's conclusion without completing anything. Additionally, the survey required answers in every field, ensuring that there was no missing information.

### 4.2.3 Demographic Characteristics and Their Implications

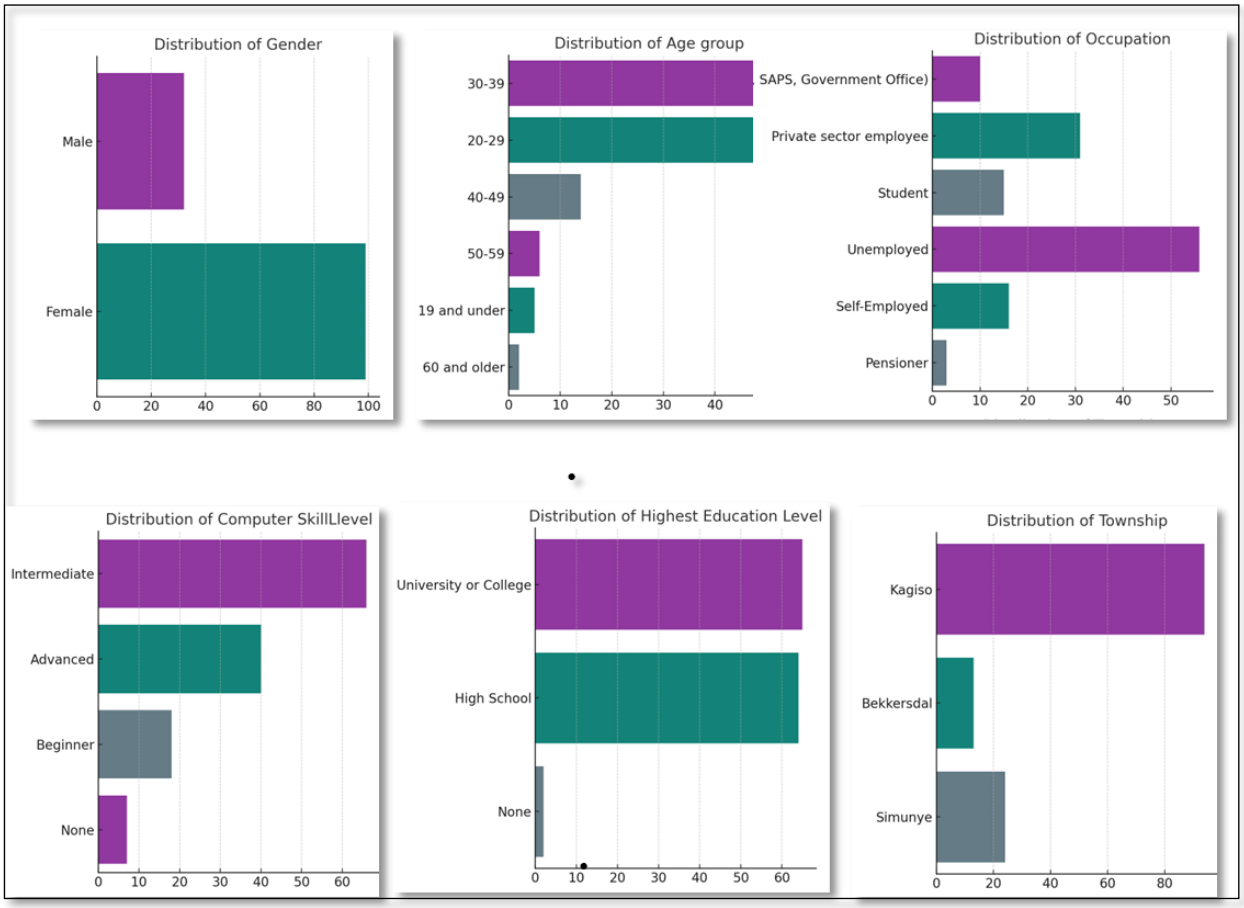


Figure 4- 1: Visualisation of Demographic information of respondents

From the data presented in Figure 4- 1, the following observations were made:

**Gender and Internet Access**: The predominance of female participants (99 out of 135) in the survey provides a unique lens to understand the gendered impact of fibre-based Internet. This distribution allows for an exploration of how improved Internet connectivity might be influencing women's lives, particularly in terms of employment opportunities, education, and social connectivity.

**Age Group Dynamics**: The survey focuses on the 20–29 and 30–39 age groups, representing a significant portion of the participants, and captures the Internet usage patterns and preferences of young adults. This age group is likely to be more tech-savvy and might use the Internet for a variety of purposes, including career development, education, entertainment, and social networking. Their responses can shed light on how Internet connectivity supports their lifestyle and ambitions.

**Educational Influence**: With a substantial number of participants possessing a university or college education, the survey is positioned to understand how education level influences the utilisation of Internet services. This educated demographic might demonstrate higher proficiency in leveraging online resources for various purposes, including work, education, and personal development.

**Occupational Status**: The high number of unemployed participants (56) in the survey is particularly significant in the context of Gauteng, a region with varied economic opportunities. This aspect of the survey can provide insights into how Internet connectivity is perceived as a tool for job searching, skill development, and possibly entrepreneurship.

**Geographical Focus**: Most participants hailing from Kagiso (94) gives the study a strong localised character. This allows for an in-depth understanding of how fibre-based Internet impacts a specific community, potentially offering insights into the unique challenges and opportunities faced by residents of Kagiso.

**Computer Skills and Household Size**: The prevalence of intermediate computer skills and larger household sizes suggests a community that is moderately familiar with technology and where Internet usage might be a shared resource within households. This could influence how Internet services are prioritised and utilised in family settings.

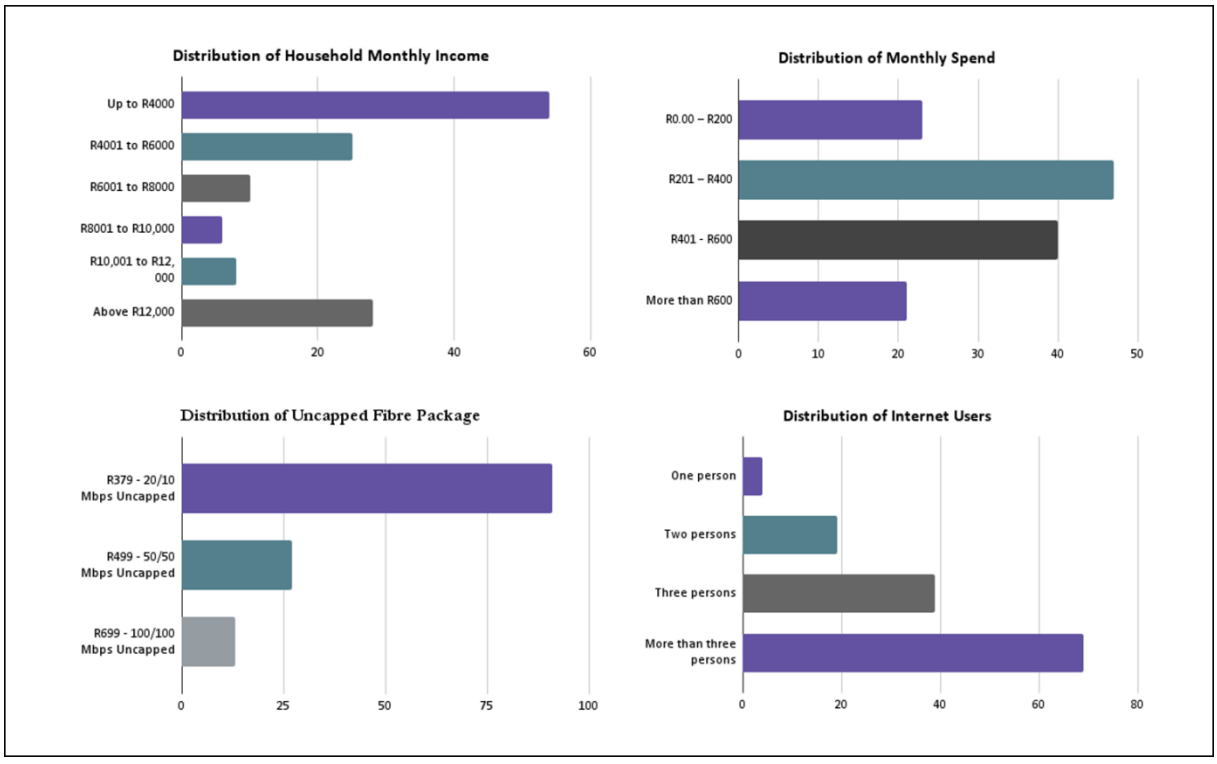


Figure 4- 2: Visualisation of Economic information of respondents

From the data presented in Figure 4- 2, the following observations were made:

The characteristics of uncapped fibre package options, household size, spending preferences, and income distribution collectively depict a community with diverse needs, economic profiles, and preferences. These insights are crucial for tailoring Internet services to meet the unique requirements of this community.

**Different Fibre Package Options:** The data shows that participants have different preferences for uncapped fibre packages. The majority, 69.5%, prefer the R379 - 20/10 Mbps Uncapped option. This suggests a strong preference for low-cost options with average speeds. The R499 - 50/50 Mbps Uncapped option is the second, with 20.6% of participants opting for it. The R699 - 100/100 Mbps Uncapped option, on the other hand, has the lowest adoption rate of 9.9%, indicating a lack of interest in higher-speed packages due to price. The R379 package is very popular, which indicates that the people who choose uncapped fibre packages do so with high regard for affordability and economic factors. This trend towards more affordable options suggests that the community as a whole strongly favours affordable options when it comes to Internet services.

**Household Users:** The distribution of Internet users in households differs. While 52.7% of participants live in households with more than three users, indicating bigger family sizes, 29.8% live in households with three users or less. On the low end, 3.1% are single-person households, while 14.5% have two users or two family members. The diverse percentages among different household sizes highlight the demographics of the community and indicate its complex demographic structure. This understanding is essential to comprehending the dynamics of Internet usage patterns and highlights the value of customised services that meet the various needs of homes of different sizes. It also draws attention to the shared nature of Internet connection, which can be a resource that several members of a household rely on and contribute to.

**Monthly Spend Range:** Participants have a wide range of spending preferences for pre-paid data or airtime bundles. The majority, 35.9%, falls between the R201 - R400 range, showing a cost-effective approach due to affordability. Furthermore, 30.5% have the capacity to spend between R401 and R600, but 17.6% can only afford lower-cost packages (R0.00 - R200). The trend towards mid-range spending highlights the community's desire to find a balance between cost-effectiveness packages and improved service standards. This approach shows a deliberate appreciation of higher-quality offerings while still taking budgetary constraints into account. The participants' different budgetary considerations are further

highlighted by the distribution across different expenditure ranges, underscoring the significance of providing a range of package options to accommodate the disparate economic capabilities within the community.

**Monthly Income Range:** The monthly income distribution of the participants reveals a diversified economic landscape. A large share (41.2%) has an income of up to R4000, whereas 21.4% has an income of more than R12,000. The remaining members are spread across several income levels, displaying a diverse economic profile. The data demonstrates a range of income levels, representing the community's economic diversity. However, the presence of participants with earnings greater than R12,000 shows that the data includes people who earn above the normal range.

### 4.2.4 Reliability Analysis

Figure 4- 3 illustrates that all the Cronbach's alpha values for each construct exceed the established minimum threshold of 0.6, as suggested by Dasgupta, Biswal, and Ramesh (2017, 44). This signifies the reliability of the items within each construct.

For ease of reference, the researcher is going to use the codes BIEI, BISI, AIEI and AIS. BIEI and BISI represent all the perceived economic (6) and social base-line items (5) prior to the installation of uncapped fibre, whereas AIEI and AISI represent all the perceived economic (6) and social (6) base-line items after the installation of uncapped fibre.

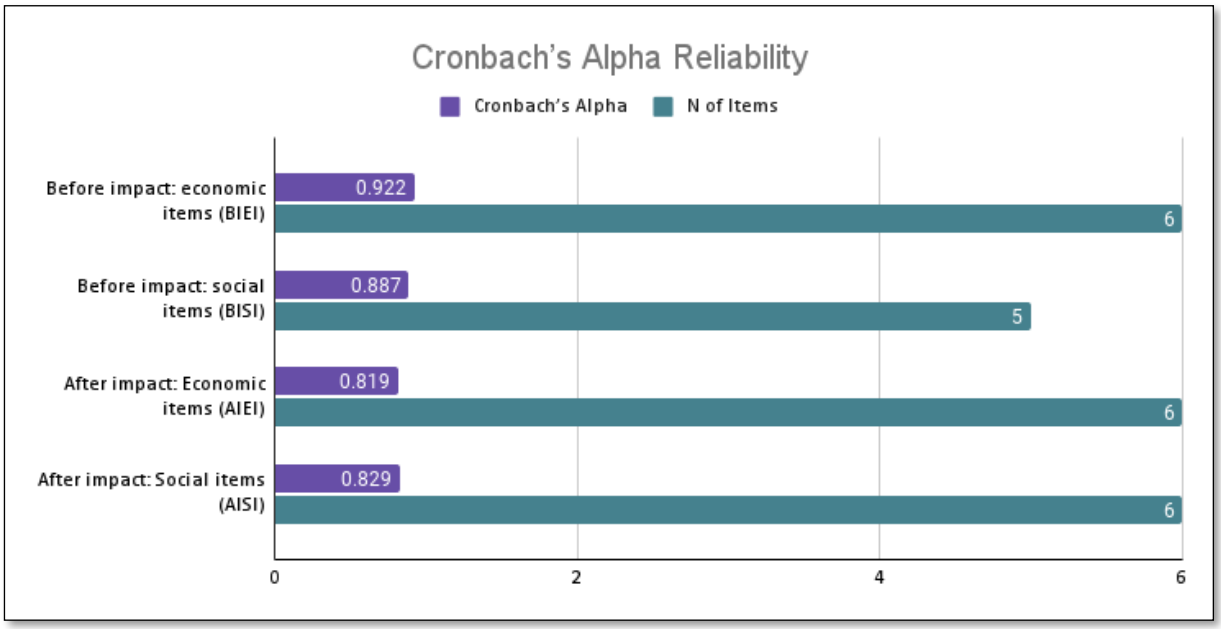


Figure 4- 3: Cronbach's Alpha Reliability Table

- **Before Impact:**

  Economic Items (BIEI): Cronbach's Alpha = 0.922 (6 items)

  Social Items (BISI): Cronbach's Alpha = 0.887 (5 items)

- **After Impact:**

  Economic Items (AIEI): Cronbach's Alpha = 0.819 (6 items)

  Social Items (AISI): Cronbach's Alpha = 0.829 (6 items)

These results indicate the internal consistency and reliability of the items within each impact category (Before and After). As a result, the study found that both economic and social items had strong internal consistency both before and after the installation of uncapped fibre, demonstrating their accuracy in measuring economic and social principles throughout the investigation.

### 4.2.5 Relationship Between Variables

According to Koo and Li (2016:156), when analysing the significance of the correlations in the table below, the following benchmarks are used: A correlation of 0 to less than 0.2 indicates a very weak correlation, a correlation of 0.2 to less than 0.4 indicates a weak correlation, a correlation of 0.4 to less than 0.6 shows a moderate correlation, a correlation of 0.6 to less than 0.8 indicates a strong correlation and a correlation of 0.8 to 1 indicates a very strong correlation.

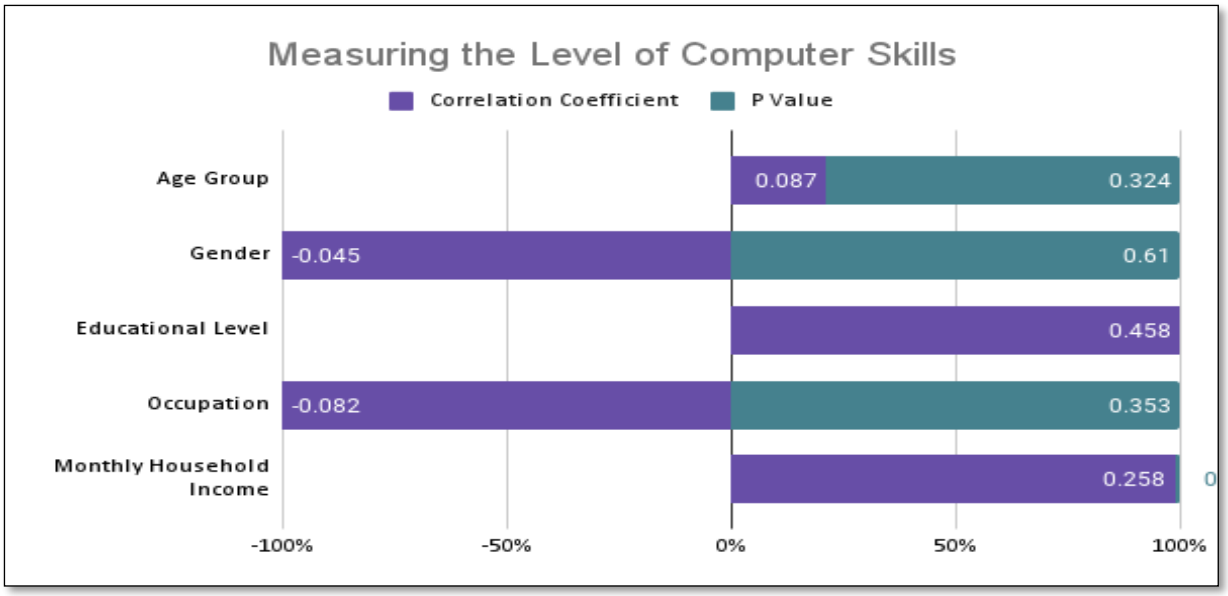

Figure 4- 4: Measuring correlation coefficient.

From the data presented in Figure 4- 4, the following observations were made:

- **Age Group:**
  Correlation Coefficient: 0.087
  Interpretation: A minimal positive correlation suggests a slight trend for computer skills to improve with age.
  Statistical Significance (p-value): 0.324 (statistically insignificant)

- **Gender:**
  Correlation Coefficient: -0.045
  Interpretation: A small negative correlation indicates that females have slightly lower computer skills than males.
  Statistical Significance (p-value): 0.610 (statistically insignificant)

- **Educational Level:**
  Correlation Coefficient: 0.458
  Interpretation: A significant positive correlation suggests that individuals with higher education levels have stronger computer skills.
  Statistical Significance (p-value): **<0.001 (statistically significant)**

- **Occupation:**
  Correlation Coefficient: -0.082
  Interpretation: A slightly negative correlation implies a mild tendency towards slightly lower computer skills in some occupational categories.
  Statistical Significance (p-value): 0.353 (statistically insignificant)

- **Monthly Household Income:**
  Correlation Coefficient: 0.258
  Interpretation: A moderately positive correlation indicates a significant connection, suggesting that individuals with higher monthly household incomes typically have better computer skills.
  Statistical Significance (p-value): **0.003 (statistically significant)**

Additionally, there is a significant positive correlation (0.458) between educational level and computer skills (p 0.001), showing that people with higher education levels tend to have better computer skills. Furthermore, there is a moderately significant correlation (0.258) between monthly household income and computer skills, implying that people with higher salaries often

tend to have better computer skills (p = 0.003). These results highlight the importance of education and income in determining computer skills in the study population. Other relationships are not statistically significant, such as age, gender, and occupation.

However, while the overall relationship between occupation and computer skills in the study is slightly negative and statistically insignificant, the study must consider jobs that require regular use of computers, even if the correlation is weak. This perspective emphasises the significance of considering the type of computer-related tasks within various occupations.

### 4.2.6 Perceived Impact "Before" Uncapped Fibre Installation

#### 4.2.6.1 Before Impact: Economic Items (BIEI)

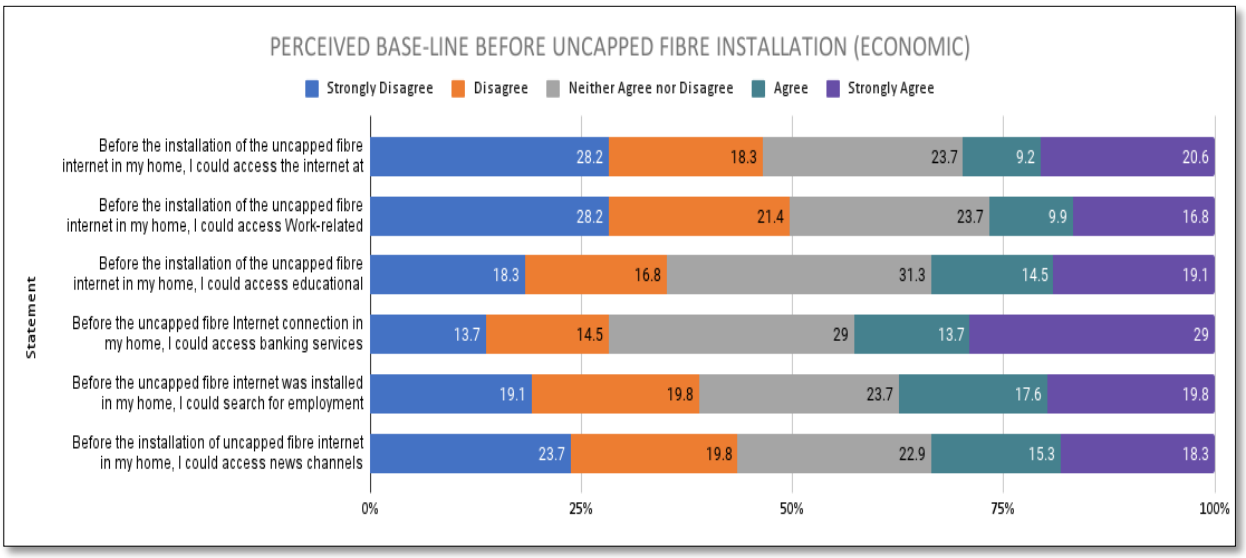


**Figure 4- 5: Measuring the perceived economic impact before fibre installation.**

From the data presented in Figure 4- 5, most participants reported difficulty with multiple online activities before installing uncapped fibre Internet. 46.5% of the participants found it challenging to access the Internet at any time, with 28.2% strongly disagreeing and 18.3% disagreeing. Combining the percentages of those who strongly disagreed (28.2%) and disagreed (21.4%), work-related duties, including working from home, were challenging for 49.6% of participants. 35.1% of respondents reported difficulty accessing educational material, with 18.3% strongly disagreeing and 16.8% disagreeing. Similar difficulties were experienced by 43.2% when trying to use banking services (13.7% strongly disagreed, 14.5% disagreed), and 39.9% found it difficult to search for employment online (19.1% strongly disagreed, 19.8% disagreed). Additionally, 23.7% strongly disagreed, and 19.8% disagreed, while 43.5% reported having trouble accessing news platforms. This data highlights significant barriers to using the Internet for a variety of purposes before the deployment of uncapped fibre Internet.

The research highlights a number of difficulties people had when engaging in various online activities before the deployment of uncapped fibre Internet. A substantial number of the participants found it challenging to access the Internet at any time, carry out work-related duties, access educational content, and financial services, look for work, and watch news channels. More specifically, difficulties with general Internet access were reported by more than two-thirds of respondents (46.5% strongly disagreeing and 18.3% disagreeing). Nearly half of the participants (49.6%) reported difficulty with online duties that had to do with their jobs. Over a third of the respondents (35.1%) had trouble accessing educational content, and a significant number (43.2%) and 43.5%) of them had difficulty using banking services and news sources. This data demonstrates the widespread issues that participants in these areas had when engaging in various online activities, highlighting the critical need for better Internet connectivity before the deployment of uncapped fibre Internet.

#### 4.2.6.2 Before Impact: Social Items (BISI)

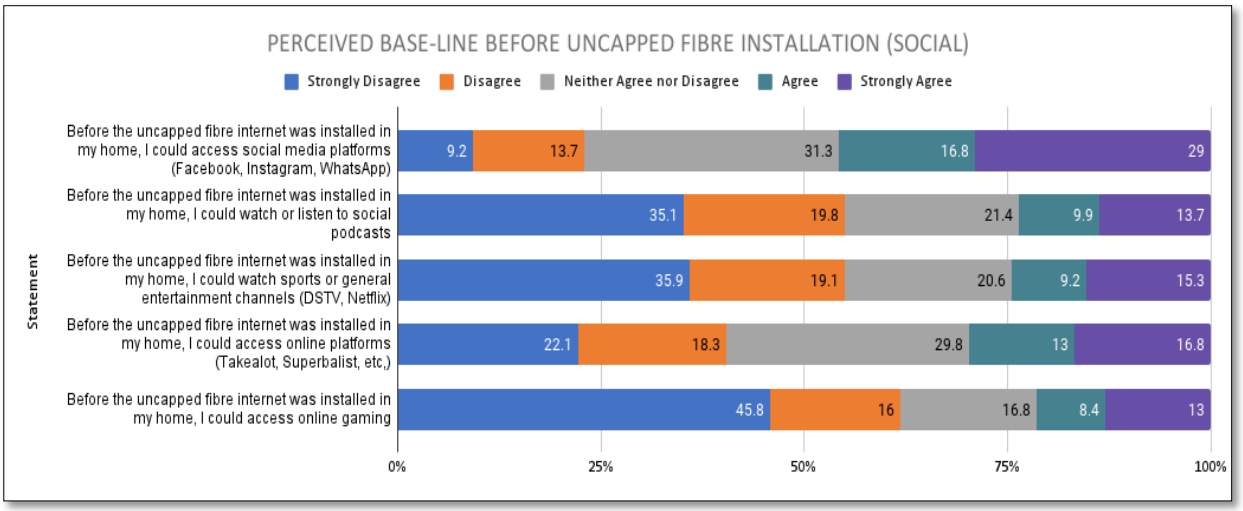


**Figure 4- 6: Measuring the perceived social impact before fibre installation.**

The data presented in Figures 4- 6 shows that participants experienced significant challenges using various online services before implementing uncapped fibre Internet. 53.2% of participants reported difficulty accessing social media platforms (Facebook, Instagram, and WhatsApp), with 9.2% strongly disagreeing and 13.7% disagreeing. While accessing sports or general entertainment channels (DSTV, Netflix) was difficult for 55% of the participants (35.9% strongly disagreed, 19.1% disagreed), watching or listening to social podcasts was difficult for 48.9% of participants (35.1% strongly disagreed, 13.7% disagreed). 40.1% found it challenging to access online platforms (such as Takealot and Superbalist) (22.1% strongly disagreed, 18.3% disagreed), and 62.4% found it challenging to play online games (45.8% strongly

disagreed, 16% disagreed). These numbers show the significant challenges that participants faced before the installation of uncapped fibre Internet while trying to access social media, podcasts, entertainment channels, e-commerce platforms, and online gaming.

The data provides a complete picture of the difficulties that participants faced prior to the implementation of uncapped fibre Internet. More specifically, more than half of the respondents (53.2%) found it challenging to access social media platforms, showing considerable challenges in maintaining connections with online social networks. Additionally, nearly half of the respondents (48.9%) found it difficult to access social podcasts, which is an indication of accessibility issues with digital media. Most participants (55%) could not access programmes like sports or general entertainment channels, emphasising the barriers to accessing recreational content. When it came to accessing platforms like Takealot and Superbalist, 40.1% of participants reported having trouble, underscoring challenges with e-commerce activities. Additionally, a significant 62.4% of participants reported having difficulty accessing interactive and entertainment gaming platforms online, showing significant challenges.

These results highlight the many challenges that participants experienced, from entertainment and leisure time to social connectivity and digital engagement. The information shows how much more people need better Internet access to engage in a variety of online services and activities.

### 4.2.7 Perceived Impact "After" Uncapped Fibre Installation

#### 4.2.7.1 After Impact: Economic Items (AIEI)

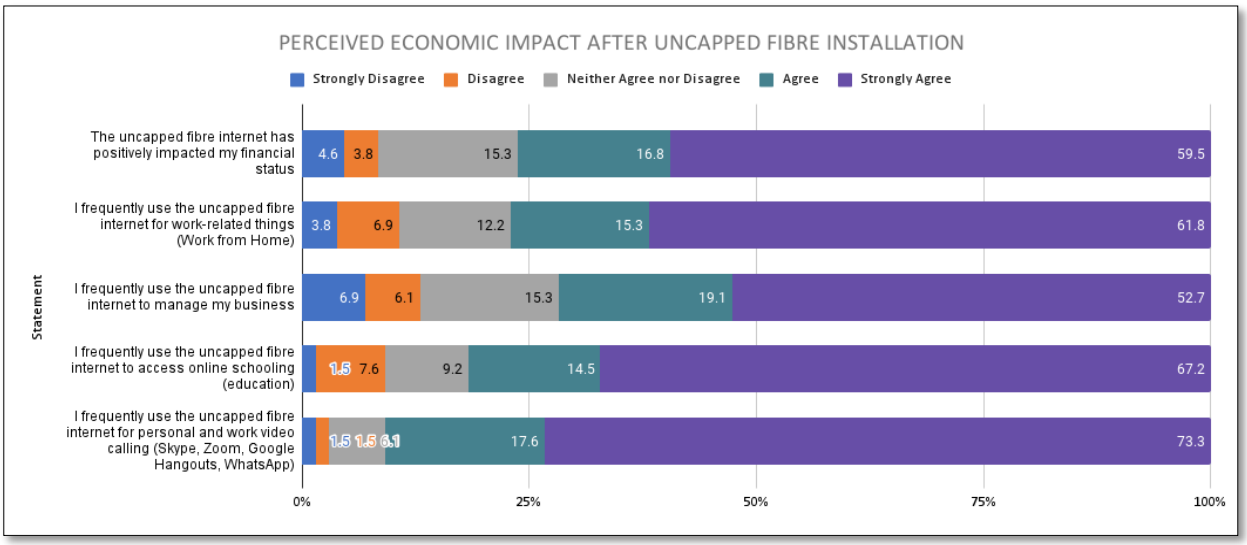


Figure 4- 7: Measuring the perceived economic impact after fibre installation.

According to data presented in Figure 4- 7 on perceived impact following the installation of uncapped fibre Internet, there has been a significant positive impact on many different elements of participants' lives. An overwhelming 76.3% of the participants (16.8% agreed and 59.5% strongly agreed) indicated uncapped fibre Internet had a good influence on the financial situation. This shows that increased Internet access and financial security are strongly correlated.

Furthermore, the impact on activities related to employment was significantly more noticeable. Uncapped fibre Internet usage for work-related activities, notably working from home, was reported by a remarkable 77.1% of participants (15.3% agreed and 61.8% strongly agreed). This highlights the crucial role that reliable Internet access plays in enabling remote work, a trend that is becoming more and more significant in modern professional settings.

The data indicates that 71.8% (19.1% agree and 52.7% strongly agree) participants said they commonly use uncapped fibre Internet for business-related objectives, demonstrating the influence's impact on the management of businesses. This demonstrates the importance of quality Internet to entrepreneurial operations and entrepreneurial activities. When it came to education, 81.7% of participants used uncapped fibre Internet for online education (14.5% agreed and 67.2% strongly agreed), highlighting its importance in enabling remote learning and educational growth.

An impressive 90.9% (17.6% agreeing and 73.3% strongly agreeing) commonly used uncapped fibre Internet for personal and professional video calling. This emphasises how important dependable high-speed Internet is for maintaining connections on platforms like Skype, Zoom, Google Hangouts, and WhatsApp—both personally and professionally.

In conclusion, the evidence strongly supports the conclusion that the implementation of uncapped fibre Internet had a profoundly positive influence, greatly improving financial stability, enabling remote work and business administration, promoting online education, and fostering seamless video communication.

#### 4.2.7.2 After Impact: Social Items (AISI)

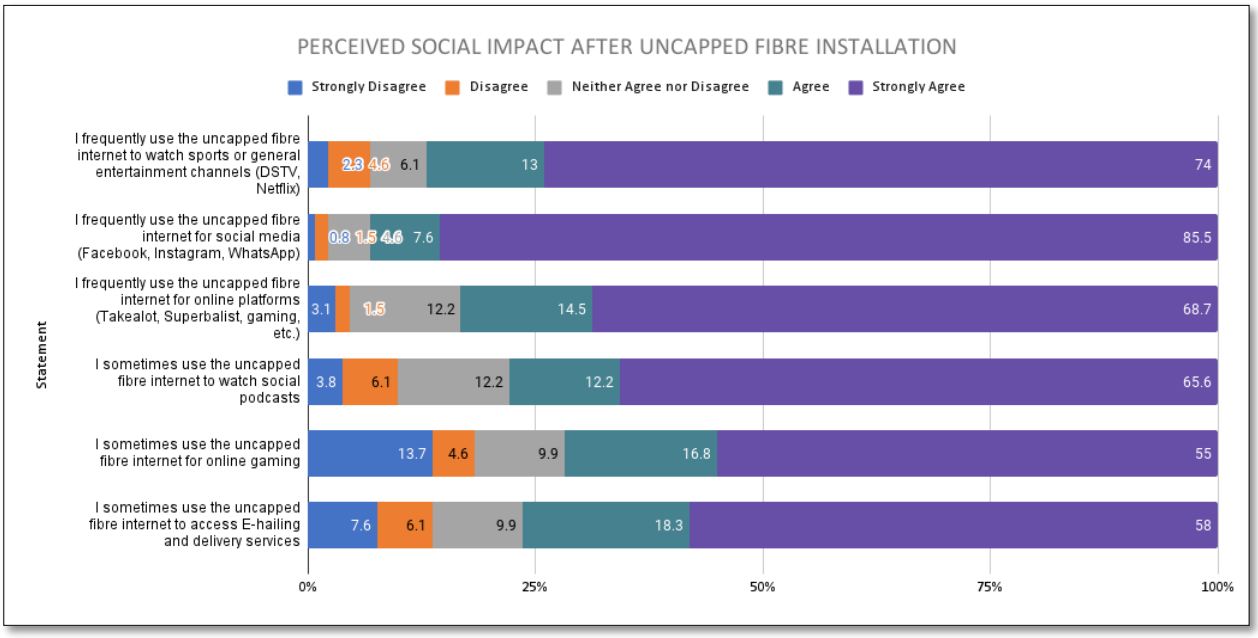


**Figure 4- 8: Measuring the perceived social impact after fibre installation.**

The data presented in Figure 4- 8 shows that the deployed uncapped fibre Internet has had a significant influence on the lives of the participants in terms of social and entertainment aspects. A substantial 87% of participants usually watched sports or general entertainment channels on the Internet, including DSTV and Netflix, indicating a huge increase in leisure time after Internet deployment. Additionally, a remarkable 93.1% of participants admitted to using uncapped fibre Internet for social media activities, highlighting the vital role that it plays in fostering social connectivity on websites like Facebook, Instagram, and WhatsApp. Also showing the importance of the Internet for online shopping and leisure activities is that 83.2% of participants frequently used online platforms, including Takealot, Superbalist, and gaming platforms. 78% of respondents were also able to access social podcasts, highlighting the importance of the Internet in enabling the consumption of multimedia content. Additionally, 73.8% of respondents occasionally used uncapped fibre Internet for online gaming, indicating that a substantial proportion of participants participated in such activities. 76.3% of the participants used e-hailing and delivery services, demonstrating the Internet's role in providing convenient transportation and delivery alternatives.

### 4.2.8 The “Before” and “After” Impact Scenario Visualisation

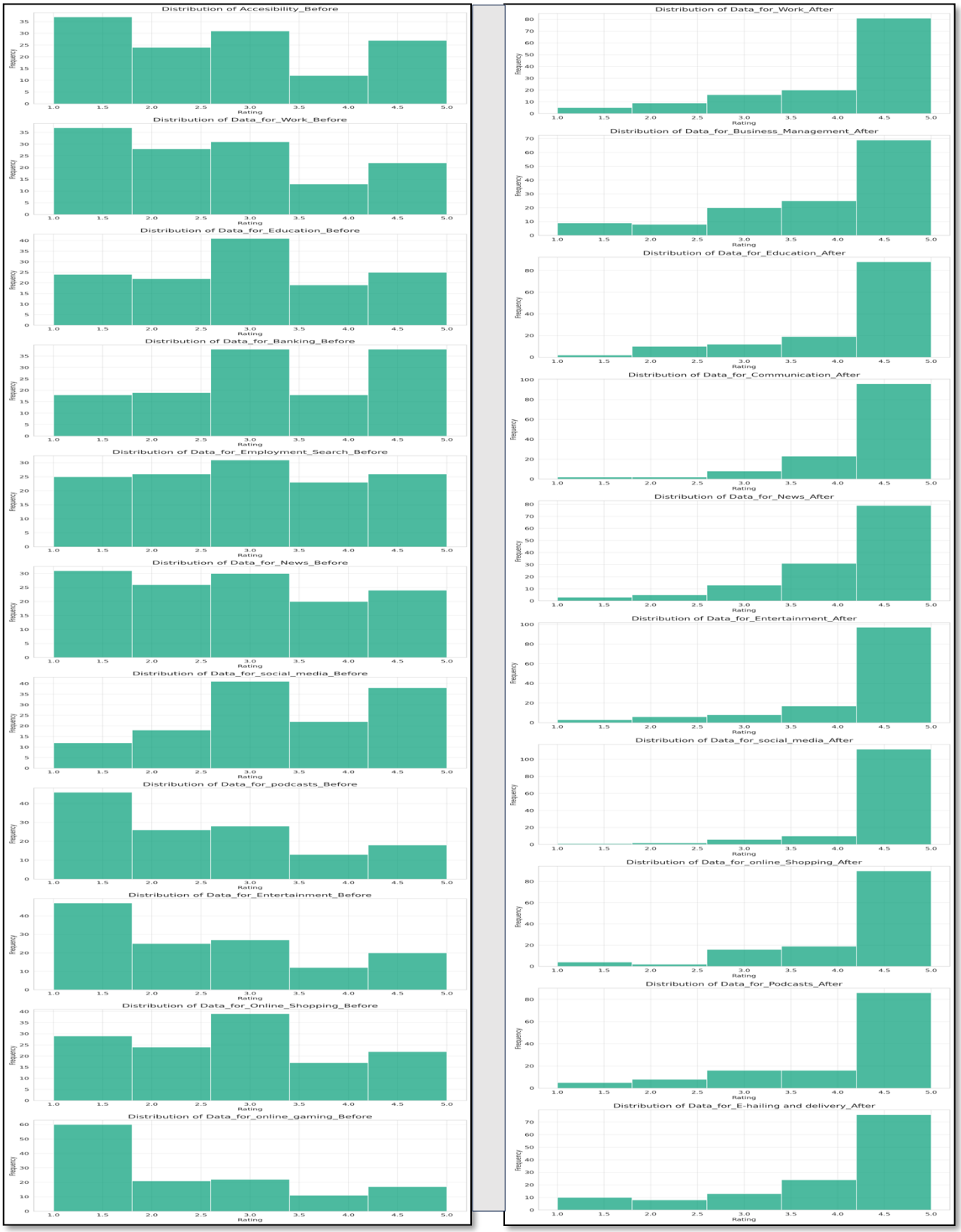


Figure 4- 9: Before and After Scenario Visualizations

#### 4.2.8.1 Observations From "Before" Scenario Visualizations

- Internet Accessibility: The "Before" responses for Internet accessibility show a spread across the scale, with no single rating dominating. This suggests varied perceptions of Internet accessibility prior to fibre deployment.

- Internet Usage: Usage for education, work, and entertainment purposes appears to have a moderate to high rating, indicating that even before fibre deployment, the Internet was an integral part of these activities for many respondents.

- Internet Benefits: Perceptions of the benefits of the Internet for activities such as education, work, and social connection show a lean towards the higher end of the scale. Respondents generally acknowledged the benefits of Internet access in these areas.

- Challenges Faced: The responses indicate that challenges such as affordability and reliability of the Internet were significant issues before the deployment of fibre.

#### 4.2.8.2 Observations From "After" Scenario Visualizations

- Improved Accessibility: Post-deployment, the ratings for Internet accessibility appear to be higher overall, indicating an improvement in how respondents view Internet accessibility.

- Increased Usage: There's a noticeable shift towards higher ratings in Internet usage for all listed activities, suggesting that the deployment of fibre has enhanced engagement with the Internet for education, work, and entertainment.

- Recognition of Benefits: The benefits of Internet access, especially for education and work, are rated even higher post-deployment, which reflects a positive impact on the respondents' socio-economic conditions.

- Mitigation of Challenges: The challenges related to the Internet, such as costs and reliability, seem to have been addressed to some extent, as indicated by the lower frequency of low ratings in the "After" scenario.

These observations provide a clear indication that the deployment of affordable fibre-based Internet had a positive impact on the surveyed community's perception and usage of the Internet across various activities.

#### 4.2.8.3 Observations From Box Plots

The below data in Figure 4- 10 on participants' responses to various activities before and after the installation of uncapped fibre Internet provides insights into median responses, response spread, and potential outliers. The data demonstrates varying effects across various activities, with some presenting a more consistent experience (narrow IQR) and others demonstrating a greater range of responses (wider IQR), indicating potential differences in the perceived impact of uncapped fibre Internet across activities. Outliers in specific activities may indicate exceptional good or bad experiences that differ from the majority.

The study would also like to link the information on Internet usage ratings "After", as shown in Figure 4- 11, for deployment with the statistical measures for household income, providing a comprehensive view of the impact across different income levels.

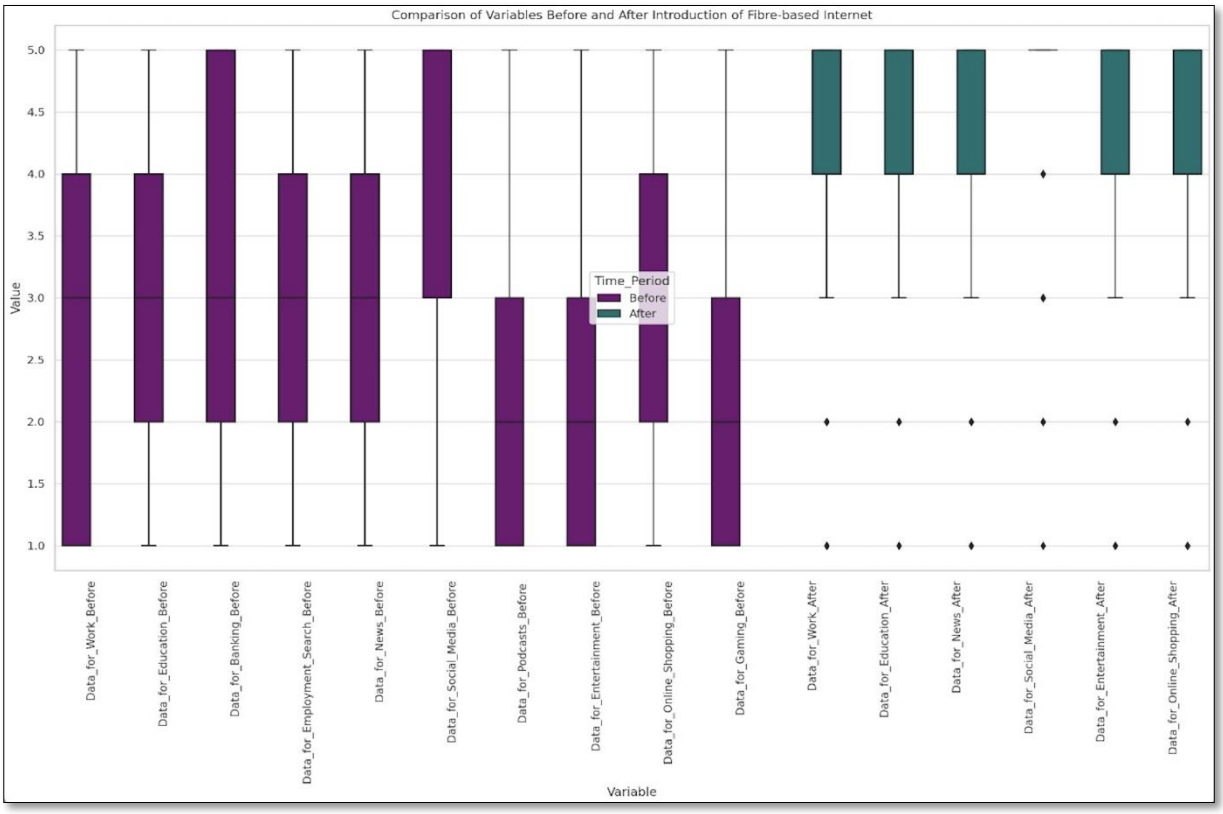


**Figure 4- 10: Comparison of variables before and after the introduction of fibre-based Internet**

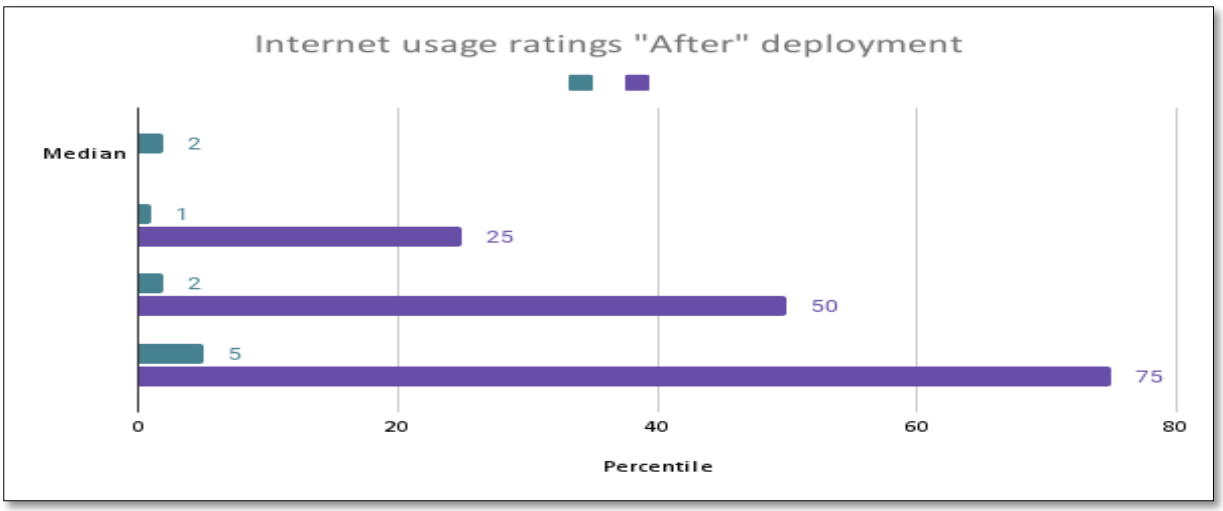


Figure 4- 11: Internet usage rating “After” Deployment

### 4.3 Median Responses

The above data in Figure 4- 11 shows the median responses range from 2.00 to 5.00 across all activities. For instance, the median rating for gaining access to work-related things (Work from Home) is 3.00, indicating that participants reported a positive impact on gaining access to work-related activities on average.

However, the median response of 2 in Internet usage ratings "After" deployment corresponds to the household income statistics, showing that half of the households have a moderate impact (rated 2 or less).

**Spread of Responses (Interquartile Ranges - IQR)**

The interquartile ranges (IQRs) indicate the distribution of responses within the median 50% of participants. The IQR for activities such as accessing work-related content ranges from 2.00 to 4.00, indicating a moderate variance of responses. Accessing news channels, on the other hand, has a smaller IQR ranging from 4.00 to 5.00, indicating a more concentrated group of responses. A higher IQR, such as that seen when accessing online gaming (1.00 to 5.00), indicates a broader spectrum of experiences, from highly favourable to potentially negative.

Additionally, the IQR of Internet usage ratings demonstrates the range of experiences within each income level. When this is combined with the percentiles from the household income data, it is clear how the influence varies at different positions along the income distribution.

**Outliers**

Responses that fall significantly beyond the IQR will be used to identify potential outliers. For example, accessing online gaming has a broader IQR ranging from 1.00 to 5.00, with 5.00

being the median response, implying that a portion of participants may have exceptionally positive experiences with online gaming following the installation of uncapped fibre Internet.

Furthermore, the outliers in Internet usage ratings, particularly in lower-income groups, may correspond with lower percentiles, indicating that a percentage of households with lower incomes might not enjoy the same benefits as the majority.

## 4.4 Notable Observations

### 4.4.1 Changes in Usage Patterns

Across numerous activities, such as work-related tasks, online schooling, personal and work video calling, and access to news channels, social media, and online platforms, a consistent increase in median responses is observed in the "After" deployment. This indicates a significant positive impact on Internet usage patterns in these areas.

### 4.4.2 Consistency Across Variables

The continuous increase in median responses across multiple variables, including economic and social activities, demonstrates the uncapped fibre-based Internet's pervasive and broad beneficial impact. This consistency suggests that the implementation has resulted in significant improvements to numerous areas of participants' online experiences.

**Outliers**

While outliers can be observed when people have access to online gaming, looking at the boxplots for possible extreme values in the data could uncover unique circumstances. These remarkable observations show that uncapped fibre-based Internet has a beneficial and consistent impact on participants' online activity, with potential deviations in particular places that demand a closer analysis of outliers or unusual situations.

#### 4.4.2.1 ANOVA Test and Observations

The analysis of variance (ANOVA) testing described below from Figure 4- 12 is used to determine whether there are statistically significant differences in the means of the combined average monthly household income among various groups based on the Internet speed packages chosen.

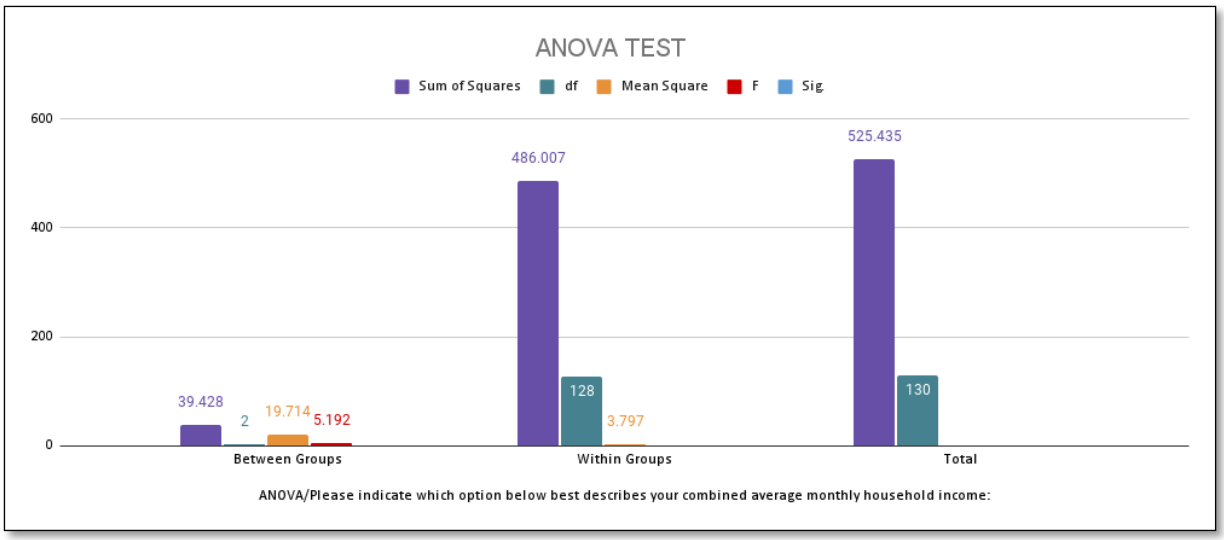


Figure 4- 12: ANOVA Test

**Between Groups:**

- The sum of squares between groups is 39.428.
- The degree of freedom (df) between groups is 2.
- The mean square (MS) is 19.714.
- The F-statistic is 5.192.
- The p-value (Sig.) is 0.007, which is less than the typical significance level of 0.05.

**Within Groups:**

- The sum of squares within groups is 486.007.
- The degree of freedom (df) for within groups is 128.
- The mean square (MS) is 3.797.

**Total:**

- The total sum of squares is 525.435.
- The total degree of freedom (df) is 130.

### 4.4.3 Observations from ANOVA Tests

The analysis of variance (ANOVA) results for combined average monthly household income across different Internet speed packages show statistically significant differences in income levels across fibre package plans. This results in an F-statistic of 5.192, with a p-value of 0.007, which highlights the importance of these inconsistencies. This data corroborates the hypothesis, demonstrating that selecting an Internet package is associated with noticeable changes in participants' combined monthly household income. In essence, the statistical

evidence indicates the potential socioeconomic aspects influencing the selection of various fibre Internet plans, which is a result of higher or lower household income.

#### 4.4.3.1 **Observations from Correlation Matrix Heatmap**

We use a correlation matrix to determine which relationships to explore first, as shown in Figure 4- 13. The correlation matrix enables us to identify which relationships, depending on the sign and significance of the correlation coefficients, need more investigation. A negative correlation indicates a negative relationship in which one variable tends to rise while the other decreases, whereas a positive correlation shows a direct association where variables increase or decrease together.

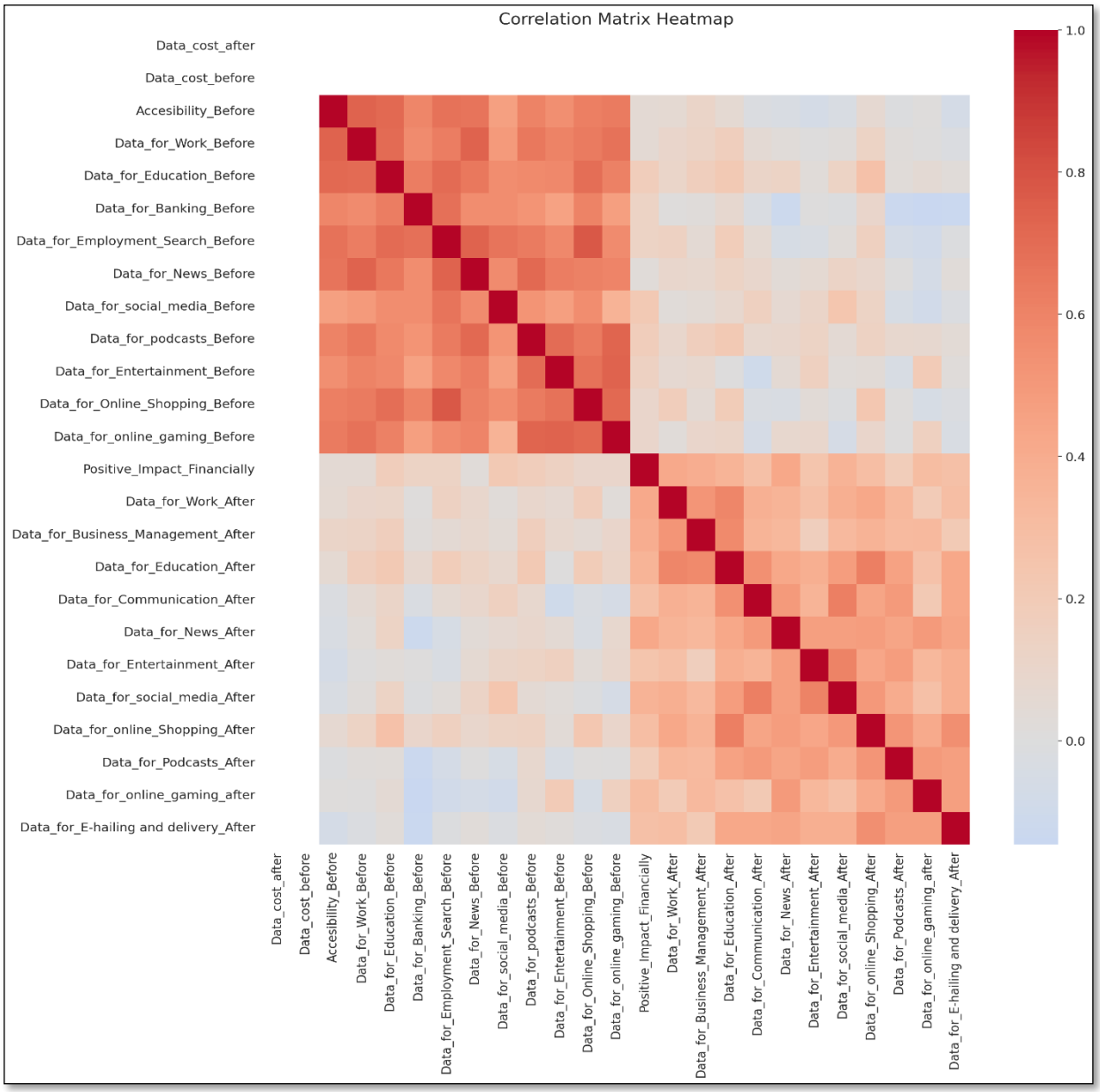


**Figure 4- 13: Correlation Matrix**

## 4.5 Conclusions

The detailed analysis of the data shows that the implementation of uncapped fibre Internet has had an evident and major effect on the participants' standard of life. Prior to the deployment, there were several issues with general Internet access, work-related tasks, educational materials, financial services, job hunting, and news channels. However, all of these areas exhibited significant improvements after the implementation of the affordable uncapped fibre Internet. Unfortunately, the lack of online health services in South Africa impeded the assessment of the perceived positive health effects facilitated by affordable fibre Internet.

The many aspects of Internet accessibility significantly improved after the fibre deployment, and particularly notable was the continuous access to online shopping, educational resources, work-related tasks, social networking platforms, and entertainment channels made possible by the uncapped fibre Internet. Furthermore, the participants noted significant improvements in their ability to manage finances, perform remote jobs, perform online education, and take part in recreational activities like gaming and digital media consumption. The data further demonstrates the importance of affordable fibre Internet for developing interpersonal relationships, providing various entertainment options, promoting educational progress, and making practical activities easier using e-hailing and online shopping platforms. The widespread positive impacts of deploying affordable fibre Internet are further highlighted by the consistent trend of high percentages in agreement and strong agreement across the above-mentioned categories.

Finally, the uncapped fibre Internet deployment not only corrected pre-existing challenges in those communities but also brought forth a new era of improved connectivity and accessibility through affordable fibre Internet. It also greatly increased participants' capacity to participate in a range of online activities (including this study’s survey), encouraging social integration, academic advancement, operational effectiveness, and enjoyable experiences. This change emphasises the crucial part that affordable fibre Internet plays in influencing modern lifestyles and promoting a society that is digitally linked.

# CHAPTER 5 DISCUSSIONS AND CONCLUSIONS

## 5.1 Introduction

The results of the data analysis and data interpretation were discussed in the previous chapter. The researcher stated the problem statement, questions, and study objectives in chapter one. This study investigated the perceived economic impact of uncapped fibre prior to deployment (BIEI), the perceived social impact of uncapped fibre prior to deployment (BISI), the perceived economic impact after uncapped fibre deployment (AIEI), and lastly, the perceived social impact after uncapped fibre deployment (AISI). Measurement of computer skills in relation to age group, gender, educational attainment, occupation, and monthly household income were more variables that were examined. The problem statement and the methodology will be restated in this final chapter, which will also include an assessment of the findings and discussions, a conclusion, a suggestion for further research, a delineation of the study's scope, and a summary of the chapter.

## 5.2 Summary of the Study

The researcher presented the problem statement in chapter one, stating that few research studies have been conducted to assess the impact of affordable, uncapped, fibre-based Internet access on social and economic factors in Gauteng, specifically in the West Rand region. This study aims to assist in bridging this gap where countries can implement policies focused on digital inclusion, ensuring every citizen can participate in the country's social and economic activities (Sieck 2021). To further support this call to close the gap, both the public and private sectors can intervene to integrate excluded populations into the economy, which necessitates the construction of networks in rural and underserved areas to allow inclusive economic growth (Frans 2020, pp.15).

This study used a quantitative methodology rather than a qualitative or mixed-method approach. An online questionnaire was developed to collect data from all the participants. The researcher employed a short-answer question in Section A of the questionnaire, while Section B was based on economic data. Sections C and Section D focused on the social and economic impact of Likert scale questions, which assessed the baseline impact before and utilising a five-point Likert scale. The data collected from the 131 participants who completed the online questionnaire was analysed using the SPSS version 28. According to the statistics, out of the 131 participants, 24.4% were male respondents, and 75.6% were female respondents.

The results suggest a significant positive impact of uncapped fibre Internet on participants' lives. Economically, 76.3% of participants reported an improved financial situation, and a large percentage engaged in work-related activities, with 77.1% working from home and 71.8% using the Internet for business purposes. Socially, Internet usage was prevalent, with 87% watching entertainment channels and 93.1% using social media. Additionally, 83.2% participated in online platforms, and 78% accessed social podcasts, indicating the Internet's vital role in multimedia consumption. Furthermore, 73.8% engaged in online gaming occasionally, and 76.3% utilised e-hailing and delivery services, underlining the Internet's significance in entertainment and convenient services. These results highlight the transformative influence of uncapped fibre Internet, shaping both economic and social aspects of participants' lives.

The correlation analysis indicates significant trends in computer skills across different groups. There is a substantial positive correlation (0.458, $p = 0.001$) between computer skills and educational level, highlighting the impact of higher education on stronger computer skills. Furthermore, there is a moderate positive link (0.258, $p = 0.003$) between computer skills and higher monthly household income. This study addressed the research questions and objectives, as indicated in the previous chapters. The following discussion presents findings and discussion.

### 5.3 Summary of Findings, Conclusions and Discussions

The accessibility of affordable fibre-based Internet has a major impact on many communities. The findings highlighted the significance of digital literacy initiatives, with a needed focus on community engagement and government initiatives. The affordable fibre not only enhanced educational standards, created economic opportunities, and strengthened social relationships, but it also promoted diversity and reduced long-standing digital disparities. This study emphasises the critical role of accessible Internet in encouraging socioeconomic development, emphasising the significance of ongoing efforts in digital access.

Digital literacy is crucial for entrepreneurship, employment, and economic growth, and the survey offered insightful information that emphasised the significance of programmes for digital connectivity, education, and affordability. Recommendations through comprehensive initiatives that meet various local community requirements are required to bridge the digital divide.

## 5.4 Socioeconomic Impact of Affordable Fibre Internet Access

### 5.4.1 Internet Accessibility and Household Income

Following the summary of the findings, the data in Table 4.6 highlights not just the relationship between household income and the selection of Internet packages but also the high value that consumers place on Internet connectivity, noting the number of household persons that use the Internet and its advantages. The willingness to spend almost 10% of their household income for Internet services, even among those in lower income brackets where individuals may earn up to R4000 per month, highlights the value people have on being digitally connected. This pattern of behaviour suggests that despite financial constraints, digital connection is seen as a necessary good. People with limited financial means are prepared to prioritise Internet connectivity, which says a lot about how important technology is today. It indicates that having access to the Internet is essential for people to be able to access information, educational resources, employment prospects, and social relationships rather than just being a luxury. This study highlights the critical need for inexpensive and accessible Internet services for all socioeconomic categories and is consistent with the global trend emphasising Internet access as a fundamental human right.

### 5.4.2 Financial Challenges Faced by Different Household Sizes

The data in Figure 4- 2 highlights the relationship between the number of household individuals and household average income. The data shows that households with three or more members, particularly those with four or more, are substantially more likely to have lower incomes. The fact that a significant 64.3% of larger households and around 25.2% of three-person households fall into the lowest income category highlights the difficulties these families have in managing their finances due to the higher costs of caring for additional people. This correlation emphasises the financial struggles bigger households face, highlighting the need for specialised assistance and reasonably priced services in these communities. This correlation should be considered by policymakers and service providers when developing efforts that are relevant to the requirements of households of various sizes and financial capacities and meet them halfway.

## 5.5 Positive Socioeconomic Impact of Affordable Fibre-based Internet

The results of the research highlight the transformative impact of affordable fibre-based Internet in Lower to middle-LSM communities in Gauteng, indicating a wide-ranging positive socioeconomic impact. With the deployment of Internet connections, educational opportunities

and digital literacy have significantly improved, making it possible to access online resources and encourage the development of skills. In terms of the economy, the Internet has encouraged entrepreneurship, opened job opportunities and improved possibilities for employment. Additionally, it has strengthened relationships, promoted inclusivity and community involvement, and empowered those who are marginalised. The study emphasises the need for supporting policies and creative solutions that maintain these positive improvements, indicating a crucial step towards a more connected and empowered society.

### 5.5.1 Economic Empowerment Through Digital Access

The study conducted by Mangas *et al.* (2023:3) underlined the significance of enhancing education and training systems to provide individuals with digital capabilities as a prerequisite. The relevance of digital skills in entrepreneurship, innovation, and economic growth was highlighted in the agenda (Mangas *et al.*, 2023:20). According to Laamanen *et al.* (2022), Woolley *et al.* (2023), education and employment markets are just a few of the societal implications of the digital divide. This study similarly confirms that a lack of Internet connection causes these negative impacts, and it also found that uncapped fibre Internet had a positive impact on financial wellness. This demonstrates that increased Internet access is highly associated with increased financial stability. Furthermore, the influence on employment-related activities was significantly greater.

The evidence strongly supports the conclusion that uncapped fibre Internet had a significantly positive impact, greatly improving financial stability, enabling remote work and business administration, promoting online education, and fostering better working conditions for professionals who use opportunities to work from home. Furthermore, the data shows that a staggering 71.8% of participants commonly use uncapped fibre Internet for business-related objectives, demonstrating the impact on business management and the importance of quality Internet to business operations and entrepreneurial activities.

### 5.5.2 Social Empowerment Through Digital Access

This study concurs with the assertions that a range of variables, such as socioeconomic status (SES), geographic location, and infrastructure accessibility, affect the digital divide (Suh *et al.*, 2022). According to these studies, people with lower SES backgrounds are more likely to encounter obstacles while trying to access digital resources and information (Suh *et al.*, 2022).

In reference to this study and measuring the socioeconomic impact prior to fibre deployment, this study found that more than a third of respondents had difficulty accessing educational

content, and a significant number (43.2%) and 43.5%) had difficulty using banking services and news publications, respectively. This data reveals the widespread problems that participants in these areas experienced when engaging in various online activities, emphasising the crucial need for improved Internet connectivity prior to the rollout of uncapped fibre Internet.

These findings also emphasise the numerous difficulties that participants faced, ranging from recreational and entertainment availability to social connectivity and digital involvement. The data demonstrates that more individuals require improved Internet access to participate in a variety of online services and activities.

### 5.5.3 Correlation between Computer Skill, Education, and Income

The first objective is to discuss the social and economic empowerment that results from an affordable, uncapped Internet. Whether there was a perceived positive or negative influence, this was measured as an impact before and after the deployment of the affordable fibre. This study supports statements made by Afrobarometer and Malephane (2022:16) that, both when comparing least-developed nations to non-least-developed countries and when looking at individual Internet users, there is certainly a correlation between economic status and Internet usage. This result is consistent with other research that shows that affluent and educated individuals within society typically have more access to and utilise the Internet than those who are less privileged and have less education.

Figure 4- 1 shows that this study agrees with previous studies by Afrobarometer and Malephane (2022:16) in that it discovered a significant finding concerning educational level, demonstrating a significant correlation. This suggests that individuals who have higher education levels have better computer skills; this correlation has statistical relevance. An equally positive correlation between computer skills and monthly household income also suggests a significant connection between the two factors. This suggests that those who earn more money prove to possess superior computer skills.

This study found a correlation with prior studies by (Gray *et al.*, 2022:11), indicating older individuals had less Internet access than younger people. As can be seen in Table 4.3, this study's correlation coefficient data analysis reveals that for this age group, a marginally positive correlation suggests a very slight trend towards an improvement in computer skills with age, although this trend is statistically insignificant.

### 5.5.4 Gender Equality Digital Access

The study disagrees with studies by (Priyabadini, 2022) that closing the digital gap necessitates tackling issues such as gender inequality in addition to technology availability. According to this study, there is a very little and statistically insignificant negative association between gender and computer skills, indicating that women have slightly poorer computer skills than men. Based on these results, it can be concluded that 1) the affordable fibre deployment was carried out equitably for both males and females, and 2) there is no need to specifically focus on either gender.

### 5.5.5 Limitations in Measuring Impact on Health Services and Sample Size

The study's secondary objective and research question included assessing the influence of affordable fibre-based Internet on health services and well-being in the West Rand region. Unfortunately, the absence of online health services in South Africa hindered the measurement of the perceived positive health effects facilitated by affordable fibre Internet. Moreover, the survey did not assess health services and well-being. Recommendations for future studies will address this gap and suggest ways digital programs and government initiatives can bridge these gaps effectively. However, despite these limitations, the study will still offer recommendations for initiatives that could enhance digital connectivity in the communities.

The sample size is also a limitation in this investigation. A sample size of 317 users would be viewed as acceptable to produce a 5% margin of error with a 95% confidence level for a user population of 1800 (Siegle, 2015). However, due to difficulties with survey participation, the study only received responses from 135 individuals. As a result, this study has a 78-80% per cent confidence level and a 5 per cent margin of error.

## 5.6 Conclusions

Given the objectives and scope of the study described, we can draw the following conclusions from the data analysis we have conducted:

### 5.6.1 Primary Objective Conclusions

The primary objective was to assess the impact of affordable, uncapped, fibre-based Internet access on social and economic factors in Gauteng's West Rand District communities. From our analysis, we observed:

- Increase in Internet Usage: There is evidence of increased Internet usage for various activities such as education, work, business management, and shopping after the deployment of fibre-based Internet. This suggests that the availability of affordable fibre-based Internet has positively impacted digital access in the communities studied.

### 5.6.2 Secondary Objectives Conclusions

- Digital Access and Usage: The survey indicated a notable increase in Internet usage for various activities following the deployment of affordable fibre-based Internet. This aligns with an improvement in digital access and usage within the communities.

- Impact on Education, Employment, and Business: The data showed correlations between increased Internet usage for education and other aspects such as work and business, suggesting that fibre deployment may have had a positive impact on these socioeconomic factors.

- Health and Well-Being Impact: While the dataset did not specifically measure health and well-being, the increased Internet usage for educational and economic purposes could indirectly contribute to improved well-being by enabling access to information and resources.

- Digital Skills Gaps: The study did not directly assess digital skills gaps or the effectiveness of digital programs. However, the increased use of the Internet in various domains post-deployment suggests there may have been some improvements in digital literacy.

### 5.6.3 Research Questions

- Socioeconomic Impact: The data suggests there is a direct positive socio-economic impact in the communities due to the fibre deployment initiative, particularly in the areas of education, work, and business management.

- Change in Recreation: The dataset does not explicitly measure recreational changes. However, increased Internet usage for social media and communication post-deployment could imply an enhancement in social recreational activities.

### 5.6.4 Field of Study and Sector Under Investigation

- ICT and Digital Inclusion: The findings support the notion that improving access to fibre Internet is an important step towards bridging the digital divide and promoting socio-economic development in disadvantaged communities.

### 5.6.5 Geographical Demarcation

- The observations are specific to the communities within the West Rand District of Gauteng, and while they may indicate positive trends resulting from the fibre Internet deployment, these findings may not be generalisable to other regions without further study.

### 5.6.6 Final Conclusions

The deployment of affordable fibre-based Internet in the Kagiso, Bekkersdal, and Simunye townships appears to have had a beneficial impact on Internet usage across a variety of socio-economic activities. This aligns with the broader goals of digital inclusion and suggests that similar initiatives could be an effective tool for socioeconomic development. While the data provides a promising outlook, it also indicates the need for continuous monitoring, further research, and potentially targeted interventions to address remaining challenges, such as digital skills development.

## 5.7 Recommendations

Based on the findings, the following practical and implementable recommendations are proposed:

- Public-Private Partnerships (PPP) for Digital Infrastructure: Encourage public-private cooperation in the development of affordable and readily available Internet infrastructure. Subsidised Internet programmes should be investigated to make Internet services more accessible to low-income households. The subsidies can be adjusted based on the number of individuals that make up a household.
- Local Talent Scouting Initiatives: Implement practical local technology initiatives to recruit and develop local digital talent. This may result in opportunities for employment and skill development, promoting economic growth. This ensures continuous ongoing learning from the classroom to real-world situations.
- Sustainable Community Digital Libraries: Establish sustainable community digital libraries to ensure ongoing access to information online. Through serving as centres for education, skill development, and community involvement, these libraries can help close the digital divide. Digital libraries are crucial for promoting self-knowledge and sustaining continuous learning.
- Digital Services for Older Generations: Develop user-friendly digital systems that are suited to older generations, making sure they can access online public services. To meet the

needs of senior individuals, this may entail training initiatives and technological modifications.

- Digital Literacy Programs in Schools: Integrate robust digital literacy programmes into elementary school academic programmes. These initiatives should concentrate on giving young children the fundamental digital skills they need to become tech-savvy from an early age. The programmes can also teach about the advantages and risks of technology.

## 5.8 Future Study Recommendations

This research was conducted in Gauteng, specifically in the West Rand region. Further regions outside the West Rand can be explored to provide a more comprehensive picture of the same LSM sectors but in various regions of the province. The same study might be expanded outside of Gauteng into other provinces to better understand their problems and whether they can be solved using the same recommendations.

This study used a quantitative approach rather than qualitative or mixed methodologies. However, for future research, If time is not a constraint, a mixed-method approach could be employed to gain a better understanding of the communities that are under study.

## 5.9 Study Delimitations

This study is limited to the Information and Communications Technology (ICT) sector in Gauteng and employs a quantitative approach. A probability-stratified sampling technique was used in the investigation. The geographical locations chosen to target appropriate participants were selected because they were the first recipients of the fibre Internet deployment from the company, and they were reached through an online survey performed via the company's database.

Individuals who lived outside of the Kagiso, Bekkersdal, and Simunye areas were not included in this study. The primary objective of the study was to investigate both the economic and social effects of deploying affordable uncapped fibre in lower to Middle-LSM communities, in Gauteng.

## 5.10 Summary of the Chapter

In Chapter 5, the study discusses the discussions and conclusions of the findings in Chapter 4. The chapter begins by reiterating the research problem and objectives. It emphasises the study's focus on assessing the impact of Internet access on social and economic factors, employing a quantitative approach through an online questionnaire. The research findings

underscore the vital role of accessible Internet in enhancing educational opportunities, fostering entrepreneurship, and strengthening social connections. Despite financial constraints, households prioritise Internet connectivity, with many allocating a significant portion of their income to Internet services. The chapter delves into the challenges faced by larger households, emphasising the need for specialised assistance and reasonably priced services to bridge the digital divide effectively.

Furthermore, the study challenges gender-related digital inequities, revealing minimal gender variations in computer proficiency. It highlights the importance of government intervention in closing the digital gap and advocates for a holistic approach tailored to the unique needs of different communities. The findings emphasise that Internet access is not just a luxury but a fundamental necessity for individuals to access information, education, job opportunities, and social relationships. The chapter concludes by calling for a more inclusive digital environment, where efforts go beyond mere technology access and address underlying disparities in education and resources, ensuring that no community or individual is left behind in the digital era.

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# ANNEXURE A: INFORMED CONSENT

NWU Business School
North-West University
Private Bag x6001
Potchefstroom, 2520
http://commerce.nwu.ac.za/business-school

27 November 2023

**DEAR PARTICIPANT**

**INFORMED CONSENT TO COMPLETE SURVEY**

You are being invited to take part in a research study that forms part of a Master of Business Administration (MBA) degree. Please take some time to read the information presented here, which will explain the details of this study. Please ask the researcher or person explaining the research to you any questions about any part of this study that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research is about and how you might be involved. Also, your participation is entirely voluntary, and you are free to say no to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part now.

This study has been approved by the NWU Economic and Management Sciences Research Ethics Committee (EMS-REC) and will be conducted according to the ethical guidelines and principles of the North-West University and other international ethical guidelines applicable to this study.

**Title of the project:** *Investigating the socio-economic impact of deploying affordable fibre-based Internet in disadvantaged Middle-LSM communities in Gauteng*
**Institution:** NWU Business School

**Ethics Reference Number:** NWU-00588-23-A4

**Names and contact details of project staff**

| | Supervisor | Researcher |
|---|---|---|
| **Title, name & surname** | Prof MJ Grobler | Mr ML Balfour |
| **Full Names** | Leenta Grobler | Mbeko Balfour |
| **Function in Project** | Principle Investigator | Researcher |
| **Telephone** | 082 878 5894 | 071 442 3899 |

**What is this research study all about?**

Mr Mbeko Balfour is conducting research for his MBA degree at the NWU Business School to investigate the socio-economic impact of deploying affordable fibre-based Internet in disadvantaged Middle-LSM communities in Gauteng. The primary objective of this study is to investigate and compare the impact of social and economic factors caused by digital access through uncapped, fibre-based Internet deployment in Kagiso and Krugersdorp townships in Gauteng.



This will be achieved by comparing the social and economic effects before and after the deployment of the affordable fibre Internet. The research instrument was be designed to assess each household's economic and social effects before and after the state.

**What will be expected of you?** You will be expected to:

- Complete the survey, which should take approximately 15 minutes of your time.
- Respond to the questions in an open and honest manner.
  Please note that your responses are completely anonymous, and no personal identifiable data will be collected.

**DECLARATION**

**Declaration by participant**

By selecting the option below, I agree to take part in the research study titled: *Investigating the socioeconomic impact of deploying affordable fibre-based Internet in disadvantaged Middle-LSM communities in Gauteng.*

1. I confirm that I have read the information sheet dated 3/2/2023 for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

2. I understand that as I have completed the study anonymously it will not be possible to remove any information I have provided, as you will not be able to identify me in any way.

3. I understand that individuals from the University may look at anonymous research data collected during the study, to ensure that the study is conducted appropriately.

4. I agree that my anonymous information can be shared with individuals from the project team detailed above.

I agree to take part in the above study.

| Yes | No |
|---|---|
| **1** | 2 |

# ANNEXURE B: QUESTIONNAIRE

### SURVEY QUESTIONS

***Investigating the socio-economic impact of deploying affordable fibre-based Internet in disadvantaged MiddleLSM communities in Gauteng***

## SECTION A: DEMOGRAPHIC INFORMATION

1. Gender

| Male | Female |
|---|---|
| 1 | 2 |

2. Age group

| | |
|---|---|
| 19 and under | 1 |
| 20 – 29 | 2 |
| 30 – 39 | 3 |
| 40 – 49 | 4 |
| 50 – 59 | 5 |
| 60 and older | 6 |

3. Please indicate your highest educational level achieved.

| | |
|---|---|
| None | 1 |
| Primary School | 2 |
| High School | 3 |
| University or College | 4 |

4. Which option best describes your current occupation?

| | |
|---|---|
| Student | 1 |
| Self-Employed | 2 |
| Public sector employee (e.g., School Teacher, SAPS, Government Office) | 3 |

| | |
|---|---|
| Private sector employee | 4 |
| Unemployed | 5 |
| Pensioner | 6 |

5. Please indicate which option below best describes your **combined** average monthly household income:

| | |
|---|---|
| Up to R4000 | 1 |
| R4001 to R6000 | 2 |
| R6001 to R8000 | 3 |
| R8001 to R10,000 | 4 |
| R10,001 to 12,000 | 5 |
| Above R12,000 | 6 |

## SECTION B: ECONOMIC INFORMATION

1. Which Township do you reside in?

| | |
|---|---|
| Kagiso | 1 |
| Mogale City | 2 |
| Krugersdorp Township | 3 |

2. Which uncapped fibre package are you currently subscribed to?

| | |
|---|---|
| R379 - 20/10 Mbps Uncapped | 1 |
| R499 - 50/50 Mbps Uncapped | 2 |
| R699 - 100/100 Mbps Uncapped | 3 |

3. Please indicate your level of computer skills

| | |
|---|---|
| None | 1 |
| Beginner | 2 |
| Intermediate | 3 |
| Advanced | 4 |

4. What is the number of individuals in your household who use the Internet?

| | |
|---|---|
| One person | 1 |
| Two persons | 2 |
| Three persons | 3 |
| More than three persons | 4 |

5. **Before** the uncapped fibre was installed at your home, what was the average monthly spend on preairtime (converted to data) or pre-paid data?

6.

| | |
|---|---|
| R0.00 – R200 | 1 |
| R201 – R400 | 2 |
| R401 - R600 | 3 |
| More than R600 | 4 |

## SECTION C: PERCEIVED BASE-LINE BEFORE UNCAPPED FIBRE INSTALLATION

| **Before Impact: Economic items** | **Strongly disagree** | **Disagree** | **Neither agree nor disagree** | **Agree** | **Strongly agree** |
|---|---|---|---|---|---|
| Before the installation of the uncapped fibre Internet in my home, I could access the Internet at any time. | 1 | 2 | 3 | 4 | 5 |
| Before the installation of the uncapped fibre Internet in my home, I could access Work-related things (Work from Home) | 1 | 2 | 3 | 4 | 5 |
| Before the installation of the uncapped fibre Internet in my home, I could access educational content. | 1 | 2 | 3 | 4 | 5 |
| Before the uncapped fibre Internet connection in my home, I could access banking services. | 1 | 2 | 3 | 4 | 5 |
| Before the uncapped fibre Internet was installed in my home, I could search for employment. | 1 | 2 | 3 | 4 | 5 |

| | | | | | |
|---|---|---|---|---|---|
| Before the installation of uncapped fibre Internet in my home, I could access news channels. | 1 | 2 | 3 | 4 | 5 |

| **Before impact: Social items** | **Strongly disagree** | **Disagree** | **Neither agree nor disagree** | **Agree** | **Strongly agree** |
|---|---|---|---|---|---|
| Before the uncapped fibre Internet was installed in my home, I could access social media platforms (Facebook, Instagram, WhatsApp). | 1 | 2 | 3 | 4 | 5 |
| Before the uncapped fibre Internet was installed in my home, I could watch or listen to social podcasts. | 1 | 2 | 3 | 4 | 5 |
| Before the uncapped fibre Internet was installed in my home, I could watch sports or general entertainment channels (DSTV, Netflix). | 1 | 2 | 3 | 4 | 5 |
| Before the uncapped fibre Internet was installed in my home, I could access online platforms (Takealot, Superbalist, etc.). | 1 | 2 | 3 | 4 | 5 |
| Before the uncapped fibre Internet was installed in my home, I could access online gaming. | 1 | 2 | 3 | 4 | 5 |

## SECTION D: PERCEIVED IMPACT AFTER UNCAPPED FIBRE INSTALLATION

| **After Impact: Economic items** | **Strongly disagree** | **Disagree** | **Neither agree nor disagree** | **Agree** | **Strongly agree** |
|---|---|---|---|---|---|
| The uncapped fibre Internet has positively impacted my financial status. | 1 | 2 | 3 | 4 | 5 |
| I frequently use the uncapped fibre Internet for Work-related things (Work from Home) | 1 | 2 | 3 | 4 | 5 |
| 19. I frequently use the uncapped fibre Internet to manage my business. | 1 | 2 | 3 | 4 | 5 |
| I frequently use the uncapped fibre Internet to access online schooling (education) | 1 | 2 | 3 | 4 | 5 |
| I frequently use the uncapped fibre Internet for personal and work video calling (Skype, Zoom, Google Hangouts, WhatsApp). | 1 | 2 | 3 | 4 | 5 |

| | | | | | |
|---|---|---|---|---|---|
| 22. I frequently use the uncapped fibre Internet to access news channels. | 1 | 2 | 3 | 4 | 5 |

| **After Impact: Social items** | **Strongly disagree** | **Disagree** | **Neither agree nor** | **di Agree** | **Strongly agree** |
|---|---|---|---|---|---|
| I frequently use the uncapped fibre Internet to watch sports or general entertainment channels (DSTV, Netflix). | 1 | 2 | 3 | 4 | 5 |
| frequently use the uncapped fibre Internet for social media (Facebook, Instagram, WhatsApp). | 1 | 2 | 3 | 4 | 5 |
| I frequently use the uncapped fibre Internet for online platforms (Takealot, Superbalist, gaming, etc.). | 1 | 2 | 3 | 4 | 5 |
| 26. I sometimes use the uncapped fibre Internet to watch social podcasts. | 1 | 2 | 3 | 4 | 5 |
| 27. I sometimes use the uncapped fibre Internet for online gaming. | 1 | 2 | 3 | 4 | 5 |
| I sometimes use the uncapped fibre Internet to access E-hailing and delivery services. | 1 | 2 | 3 | 4 | 5 |

# ANNEXURE C: PERMISSION LETTER TO CONDUCT RESEARCH

**3 January 2023**

To whom it may concern,

This letter serves as notice that we at Net Nine Nine request the assistance of Mbeko Balfour to conduct market research regarding the benefits of an uncapped fibre service to residents in our coverage areas.

We will assist him in contacting our client base to conduct these surveys, and hope that the information gathered is beneficial to both our business practices and his research efforts.

Yours sincerely,

Michael Turner
Chief Experience Officer

# ANNEXURE D: CERTIFICATION OF EDITING

**ABC LANGUAGE EDITORS**
**PRETORIA ESPERANTO HEIGHTS**
**187SKINNER STREET**
**PRETORIA 0002,**
**SOUTH AFRICA,**
**PHONE: +277837975691**
**E-MAIL abceditors@gmail.com**
**Company Reg: k2016131410**

**25 November 2023**

**TO WHOM IT MAY CONCERN**

**CERTIFICATE OF EDITING**

**I Medicine Magocha,** confirm and certify that I have read and edited the entire Dissertation **Investigating the socio-economic impact of deploying affordable fibre-based Internet in disadvantaged Middle-LSM communities in Gauteng** submitted for the fulfillment of the **Master of Business Administration (MBA) DEGREE** with the **North-West University.**

The student **M.L Balfour Student no.44393628** was supervised by **Prof MJ Grobler** from **North-West University.**

I hold a bachelor's degree in languages and postgraduate degrees in business with a lot of research components and am qualified to edit such kind of academic work, aligning it to the requirements of scholarship. However, the views expressed in the study remain the onus of the researcher (s).

Yours Sincerely

Magocha M