THE NEXUS BETWEEN THE DIGITAL DIVIDE AND SOCIAL COHESION AND THEIR SOCIO-ECONOMIC DRIVERS IN SOUTH AFRICA

by

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ABSTRACT

The study aimed to achieve two objectives. Firstly, it sought to investigate the correlation between the digital divide and social cohesion in South Africa. Secondly, it aimed to evaluate the socio-economic factors contributing to the digital divide and attaining social cohesion. The study used ecological systems theory as the primary theory to underpin its research. Social categorisation and resource appropriation theories were employed as secondary theories to enhance understanding of social cohesion and the digital divide, respectively. A concurrent mixed-method design incorporating quantitative and qualitative methods was utilised to gather comprehensive data. The quantitative data was acquired through online and paper-based surveys, while in-depth interviews were conducted to obtain qualitative data. Using the Qualtrics data collection platform, the online survey was distributed through various channels and platforms, including social media, using convenience sampling. Fieldwork in three semi-urban areas in Gauteng was conducted to carry out the paper-based survey. A total of n=1140 surveys were completed, and after data cleaning, n=857 respondents were included in the final analysis using SPSS. The quantitative data collected from the survey was analysed using descriptive statistics, structural equation modelling, and regressions. Meanwhile, the qualitative phase involved purposively selecting twelve participants for an interview, with the transcripts being analysed using thematic analysis and NVivo. Eight themes were identified through a hybrid data analysis approach combining inductive and deductive approaches.

Results from the quantitative phase indicate a correlation between social cohesion and the digital divide. Socio-economic factors such as age, geographic location, and population group drive social cohesion. Similarly, age, education level, and gender influence internet access: socio-economic factors, population group, geographic location, education level, and economic activity impact internet usage. Lastly, the advantages of being online are influenced by socio-economic factors such as age, education level, and economic activity. Nine themes emerged from the qualitative analysis through an inductive and deductive approach. Participants expressed shared definitions and understandings of the digital divide and identified

its drivers, which encompassed infrastructure, affordability, electricity, and literacy levels. Regarding social cohesion, the participants expressed that the notion of a "rainbow nation" is a myth, and socio-political factors act as barriers to achieving social cohesion.

The research indicates that the digital divide significantly impacts social cohesion in South Africa. However, it is important to recognise that social cohesion and the digital divide are complex issues influenced by various factors, such as socio-economic status, race, culture, and historical context. Therefore, exploring and addressing other obstacles that prevent the country from achieving social cohesion and bridging the digital divide is vital. The report has significantly contributed to several empirical, methodological, and practical areas. The study has provided valuable insights into the digital divide, social cohesion, and socio-economic drivers, contributing to our understanding of these complex issues. The research has enriched our understanding of the digital divide and social cohesion by adopting a comprehensive approach that captures a range of perspectives and provides nuanced insights. Additionally, using both quantitative and qualitative data has enhanced the validity and rigour of the findings. Ultimately, the study's practical contributions are especially noteworthy given that social cohesion is a crucial pillar of South Africa's democratic project. Understanding the factors that hinder its attainment is essential, and this research sheds light on micro and macro factors contributing to achieving social cohesion.

KEYWORDS: Digital divide, social cohesion, South Africa, socio-economic factors, Ecological systems theory, resources appropriation theory, social categorisation theory, concurrent mixed method

DECLARATION

I, __Ayanda Magida_____, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the Doctor of Philosophy in Management degree at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Name:Ayanda Magida Signature:

Signed at …Johannesburg ……

On the ……28…….. day of ……July…… 2023…..

DEDICATION

Fukama Edith Kwatsha Sithole
02 February 1918 – February 2001

This thesis is dedicated to Mamthembu, uFukama intombi ka James Kwatsha, my late beloved maternal great-grandmother, the Matriarch. She was a remarkable woman who believed in my potential and encouraged my mother to work hard so I could receive an education. I wish you were here today to witness this milestone in my life, but I know you are with me in spirit. Your guidance and teachings have shaped me into the woman I am today, and I am grateful for your guidance in the formative years of my life. This work is dedicated to you, Thembukazi, Ndiyabulela Fukama, Qhudeni, Zanenemvula.

Muntu Nowinile Nkosi Magida
14 April 2020 - September 1935

I also dedicate this thesis to my paternal grandmother, Muntu Nowinile Nkosi Magida. A former general employee of the institution now awarding me this degree. When I used to visit her at work, I never imagined that one day I would graduate from the same institution and become a researcher. I am truly thankful for your love, support, and inspiration. Ngiyabonga MaNkosi.

“I am my ancestor's wildest dreams.”

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Lord, you alone are my portion and cup; you secure my lot. The boundary lines have fallen for me in pleasant places; surely, I have a delightful inheritance. – Psalm 16:5-6

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AMOS	Analysis Moment of Structures
ANOVA	Analysis Of Variance
ASGI	Accelerated and Shared Growth Initiative
CFA	Confirmatory Factory Analysis
CFI	Comparative Fit Index
CR	Composite Reliability
DD	Digital Divide
DDI	Digital Development Index
GEAR	Growth, Employment and Redistribution
GHS	General Household Survey
GFI	Goodness of Fit Index
ICASA	Independent Communications Authority of South Africa
ICT	Information communication technology
IDI	ICT Development Index
IFL	Incremental Fit Index
ITU	International Telecommunication Union
NDP	National development Plan
NPC	National Planning Commission
OECD	Organisation for Economic Co-operation and Development
RAT	Resources appropriation theory
RMSEA	Root Mean Squared Error of Approximation
SA	South Africa
SC	Social Cohesion
SCR	Social Cohesion Radar
SEM	Structural Equation Model
SES	Socio Economic Status
SPSS	Statistical Package for Social Sciences
Stats SA	Statistics South Africa
TA	Thematic Analysis
TLI	Tucker Lewis Index

CHAPTER 1. INTRODUCTION

1.1 Introduction

The purpose of this chapter is to introduce the thesis and provide an overview of its contents. The chapter begins with a background section that highlights the significance of the study (Section 1.2), followed by the presentation of the research problem (Section 1.3). Section 1.4 presents the research's objectives and aim, while the research questions derived from the study's objectives are outlined in Section 1.5. Section 1.6 presents the ccontribution to the advancement of knowledge, followed by the delimitations of the study (Section 1.7) and assumptions (Section 1.8). Lastly, the chapter concludes with defining key terms (Section 1.9) and a thesis outline (Section 1.10).

1.2 Background of the study

In 2012, the South African National Planning Commission (NPC) developed the National Development Plan for 2030 (NPC, 2012). The NDP emphasises the triple threat challenge presented by poverty, unemployment, and inequality (Hurlbut, 2018). The focus on poverty and inequality in South Africa is not new to the NDP but dates back to 1922, when the first Carnegie Inquiry was set up (May & Govender, 1998). Subsequently, the second Carnegie conference was held in 1983 and examined the poverty levels among the black communities and found that the majority lived under dire conditions and were poverty stricken (May & Govender, 1998). Over the years, there has been an increase in research focusing on inequality, unemployment and poverty (Baldry, 2016; Bhorat, 2009; Kingdon & Knight, 2007; Kingdon & Knight, 2004; Klasen, 2000; May & Govender, 1998; Nattrass & Seekings, 2001; Woolard, 2002). The triple problem of poverty, unemployment and inequality, as coined by Stats SA is profoundly ingrained in the economic, social, and political discourse and landscape of South Africa. There has also been a greater focus on research and government

initiatives focusing on different levels of inequality and their reduction (Hoogeveen & Özler, 2005; Nattrass & Seekings, 2001; StatsSA, 2019; Terreblanche, 2002; Woolard, 2002).

The study examined the relationship between a form of inequality known as the digital divide and its impact on social cohesion. The main objective was to determine whether the digital divide influences the level of social cohesion, either positively or negatively. Additionally, the study sought to identify the socio-economic factors that contribute to the digital divide and hinder social cohesion. Previous research has already established that the country under investigation experiences a demographic divide, indicating that achieving social cohesion requires a comprehensive evaluation of both demographic and economic aspects, particularly the socio-economic factors (Oosthuizen, 2015; Lehohla, 2017). The study sought to understand the drivers behind the digital divide in this demographic dividend country, exploring the socio-economic factors that may perpetuate or fuel the digital divide. The investigation is carried out against this backdrop.

1.2.1 *The digital divide*

The Organisation for Economic Co-operation and Development (OECD, 2001) defines the digital divide" as" the gap between individuals, households, businesses and geographic areas at different socio-economic levels concerning both their opportunities to access and use Information Communication Technologies (ICTs). Although the terms digital inequality and digital divide are used interchangeably, the study will use digital divide. The digital divide is a growing phenomenon that has increased since the late nineties due to technological developments. More recently, with the profile given to the so-called fourth industrial revolution, the digital divide interest has again gained traction. The literature on the digital divide distinguishes between three levels of digital divide, namely the first-level (access) (Blignaut, 2009), the second-level (usage and skills) (Van Dijk, 2012) and the third-level (outcomes) (Hargittai, 2002; Hargittai & Walejko, 2008; Helbig et al., 2009; Scheerder et al., 2017). Globally, research on the digital divide is measured using the ICT Development Index (IDI) (World Bank, 2016; ITU, 2017; 2023). IDI uses four indicators to measure digital

development across countries: networks, skills, uptake, and intensity (World Bank, 2016). Systems include fixed telephone lines, internet and bandwidth, cable, and wireless internet. Capabilities measure literacy, school education level, and uptake focus on computers, internet users, households with internet and individuals with smartphones. Lastly, intensity measures broadband subscription and outgoing internet traffic (World Bank, 2016). South Africa ranked 92 on the IDI global ratings, third in the African region with a score of 4.96, 5.48 for access, 3.91 for use at an individual level, and 6 for skills. One of the key indicators the International Telecommunication Union (ITU) uses is the uptake of ICT Services.

The global uptake of ICT services has increased over the years. ICT uptake per 100 inhabitants doubled between 2005 and 2016 on the following products: mobile cellular subscriptions, households with computers, households with internet access, active mobile broadband subscriptions, and individuals using the internet (ITU, 2017). Although there has been a remarkable global increase in the penetration of the abovementioned indicators, the African region still lags (ITU, 2017). A notable improvement in the region's number of households with internet access and mobile phones has been slow. For instance, in 2016, Morocco, Seychelles and South Africa had the highest number of individuals accessing the internet. Although higher than other African countries, it still needed to be improved compared to other developing and developed nations as it needed to reach the 60% uptake (ITU, 2017).

There has been a notable improvement in internet access and mobile phones globally and nationally. In 2019, the ITU Measuring the Information Society Report reported that 53.6% of households globally had internet access. Developed countries reported 86.6% (ITU, 2019). Only half of the homes in developing countries, 47.0%, and 19.1% of households in less developed countries had internet access (ITU, 2019). Between 2019 and 2022, there has been an increase in the number of people using the internet, also enabled by Covid-19. In 2023, 70% of individuals were reported to be using the internet globally. In 2019, 28.2% of households in Africa had access to the internet (ITU, 2013). In 2023, 37 % of individuals in Africa were using the internet (ITU, 2023). South Africa is among the countries whose internet access and mobile phone penetration have improved.

Over the last few years, internet and mobile penetration levels have increased in South Africa, potentially reaching a point of saturation. The most recent data from the General Household Survey compiled by Statistics South Africa in 2018 reported that 89% of households had access to a mobile device, and 64.7% had access to the Internet (Stat SA, 2018). Furthermore, internet access using mobile devices (60%) was higher than access at work (16.2%), from home (10.4%), and elsewhere (10.1%) (Stats SA, 2019). Lower Internet access and penetration were reported in rural areas (45%) compared to urban areas (63.7%) and metros (67,5%) (Stats SA, 2019). This is consistent with the global literature on internet penetration in rural and remote areas. The ITU highlighted that internet access is insufficient in bridging internet access and is inadequate to bridge the digital divide, while usage and skills play a pivotal role. The lack of ICT skills is cited as one of the barriers to effective internet use (Hargittai, 2002; Helsper et al., 2016; Várallyai et al., 2015). Data on access is widely available, making it more comfortable to gauge people's numbers with internet access in South Africa (Stats SA, 2019; Gillwald et al., 2018; Gillwald, 2017). Data on the use and skills is often problematic and not as widely available. South Africa has one of the lowest numeracy and literacy levels, impeding the successful and meaningful use of the internet and skills. Gillwald (2017) posits that the technological forms of exclusion are a reality for significant South African populations. Therefore, digital exclusion intensifies existing social exclusion mirrored in low income, unemployment, and poor access to education.

1.2.2 *Social cohesion*

Over the last three decades, there has been an increase in the research concentrating on social cohesion (Jenson, 1998; Kawachi & Berkman, 2000; Jenson, 2002; Stanley, 2003; Easterly et al., 2006; Vergolini, 2011). As such, numerous definitions of social cohesion are captured in the literature. *Social cohesion* is universally defined as a glue that binds society to forge a shared sense of identity and belonging (Jenson, 1998; Schiefer & Van der Noll, 2017; Berger-Schmitt, 2002;). Social cohesion has received much-needed attention in South Africa since the dawn of democracy. However, construed as "Ubuntu" or the "rainbow nation", social cohesion has been highlighted

in South African policies and widely documented, although not explicitly. Various strategies are enacted to foster social cohesion and bridge inequalities (Meyring & Potgieter, 2017; Njozela et al., 2017; David et al., 2018). These policy documents included the Growth, Employment and Redistribution (GEAR) strategy in 1996; this was succeeded by the Accelerated and Shared Growth Initiative (ASGI) in 2006 and later replaced by the New Growth Path (NGP) in 2010.

1.3 Research problem

Over the last two decades, several parallel discussions have arisen with the advent of "digital" technologies, especially the internet. Firstly, there is much debate and concern around "digital inequality", later defined more precisely as the digital divide. Secondly, there is an emerging view that social cohesion and other social measures of well-being should not be excluded as public and economic policy objectives. However, there is a growing recognition that the social impacts of the so-called fourth industrial revolution will be both positive and negative. Thirdly, a distinction that "some socio-economic factors contribute to the attainment of social cohesion and perpetuate further the digital divide.

This research addressed the relationship between the digital divide and social cohesion in South Africa. Understanding the socio-economic drivers of the digital divide and social cohesion in this context can help understand the causes of constraints on attaining social cohesion and how the digital divide can be addressed. Africa has the lowest average IDI performance compared to other regions (ITU, 2017). The only four African countries exceeding the average value of 4.26 for developing countries are Seychelles, South Africa, Cape Verde, and Botswana. In 2017, South Africa had an estimated 4.96 Index (0-10), making it one of the Top 100 countries in rank and value in the ITU ICT Development Index. In 2017, 61.8% of South African households had access to the Internet, 95,3% had access to a mobile cellular phone, and 21.9% had computer access (ITU, 2019). There seems to be a higher penetration of mobile phones and households with access to the internet; this does not reflect the skills and usage patterns. The literature on the digital divide is highly concentrated on

access and usage (Srinuan & Bohlin, 2011; Van Dijk, 2012). There needs to be more literature on research and data on ICT usage, skills and benefits.

South Africa also faces the triple threat of poverty, income inequality and unemployment. The extensive literature examining levels of inequality in South Africa (Woolard, 2002; Terreblanche, 2002; Stats SA, 2019; Seekings & Nattrass, 2008; Orthofer, 2016) has not translated into any solution or reduction. Therefore, it is essential to explore the issue of the digital divide and social cohesion in the study to assess how they positively or negatively influence each other. There has been some change between 2017 and 2019 in South Africans' perceptions of a united country (Meiring et al., 2018; Potgieter, 2017, 2019). In 2019, 68% of South Africans believed it possible to create a united South Africa, representing a 3%increase from 68% in 2017 (Potgieter, 2017, 2019). Social cohesion and digital and remain extensively debated and researched globally (Cruz-Jesus et al., 2012; DiMaggio & Hargittai, 2001; James, 2011; Norris, 2001; Berger-Schmitt, 2000; OECD, 2011; Stiglitz et al., 2009). There is a lack of literature investigating the digital divide and social cohesion in countries with racially polarised societies, like South Africa, and how that will perpetuate existing social and economic disparities.

Although much research has been directed at understanding the dimensions of the digital divide and social cohesion, the relationship needs to be better understood. The impact of socio-economic factors in hindering the attainment of social cohesion remains unknown. Evidence suggests that digital inclusion and social cohesion have not materialised in South Africa (Gillwald et al., 2018; Gillwald, 2017; Burns, 2018; Meyring, 2017; David, 2018). Therefore, it seeks to understand the relationship between the digital divide and social cohesion—furthermore, their socio-economic drivers in the South African context. The research question for this study is found at the connexion of several academic, philosophical, praxis-based, and international development policy debates regarding digital and social cohesion. The study argues that there needs to be digital, social, and economic inclusion for social cohesion to occur effectively. As a result of the recent Covid pandemic, most people lost their jobs, and some businesses closed.

Furthermore, it has led to an increase in the digital divide. Most workplaces became remote, and schools and higher education were forced to be online. This has undoubtedly influenced the digital divide and perpetuated different social exclusion and inequality levels. This study re-frames the triple challenge of poverty, unemployment, and inequality to explore the relationship between these emerging "triple challenges" of the digital divide, social cohesion and socio-economic factors. The intent is to understand the dynamics and relationships between these emerging challenges and to inform the public discourse and response to the profound technological change of the "digital" era. The study focused on the digital divide, social cohesion, and socio-economic drivers in South Africa. Specifically, assess if the two constructs enforce the current triple challenge enshrined in the NDP.

1.4 Justification, Aims and Objectives of the study

The main objective of this mixed-method study was to investigate the relationship between the digital divide and social cohesion and the socio-economic factors that influence them. It is worth noting that the literature review conducted for this study did not find any prior research examining the connection between the digital divide, social cohesion, and socio-economic drivers. This emphasises the importance of this study's findings in advancing the current understanding of these issues. Specifically, the study aims to determine the relationship between the digital divide and social cohesion, identify the socio-economic factors that drive these phenomena, and understand their perceived impact.

1.5 Research questions

The study examined the relationship between social cohesion and the digital divide. Considering the research problem and context outlined above, addressing the following research questions:

> **Research question 1:** What is the relationship between the digital divide and social cohesion?

Research question 2: What socio-economic factors drive the digital divide and social cohesion?

Research question 3: What is the perceived influence/effect of the digital divide in attaining social cohesion?

1.6 Study's Contribution to the Advancement of Knowledge

The study sought to contribute to the existing body of knowledge by addressing the research gap in understanding the relationship between the digital divide and social cohesion, particularly in South Africa. While there is literature on the digital divide and social cohesion, it primarily focuses on developed countries due to data availability and research emphasis. Existing literature studies the constructs separately, as such no study has been identified that has looked at both constructs. The study expands the scope of knowledge by examining this relationship in a developing country like South Africa. It provides insights into the unique challenges and dynamics that impact social cohesion and the digital divide in such contexts. It acknowledges that the digital divide and its implications for social cohesion may differ in developing countries due to socio-economic factors, infrastructure limitations, and other contextual influences.

By exploring these issues in the South African context, the study sought to offer a more comprehensive understanding of how the digital divide hinders the attainment of social cohesion and provides valuable insights into strategies and interventions that can address these challenges in developing countries. The study contributes to the existing literature by filling the gap and providing a more inclusive perspective on the relationship between the digital divide and social cohesion.

Against this backdrop, the study undertaking sought to make the following contributions:

- Providing insights on the relationship between social cohesion and the digital divide.
- Establishing the role of socio-economic factors as drivers of the digital divide and social cohesion.

The study sought to make methodological and practical contributions based on the abovementioned and, through the study, employed a mixed-method approach to assess the relationship between the digital divide and social cohesion. Research on the constructs has remained quantitatively inclined (Burns et al., 2018; Cruz-Jesus et al., 2018; Schiefer & Van der Noll, 2017; Van Deursen & van Dijk, 2019; Vercelli, 2019) based on secondary data, which may be subject to limitations. The study employed qualitative methods to address the shortcomings of the quantitative data from the surveys. Qualitative individual interviews were used to gain deeper insights and understand the relationship between the digital divide and social cohesion. This study allowed for an informed and more nuanced view of the relationship between the digital divide, social cohesion, and their socio-economic drivers.

1.7 Delimitations of the study

The following delimitations were applied in the study:

- The study's findings are vital in understanding the digital divide and social cohesion. The study's delimitations were carefully planned to ensure the accuracy and relevance of the results.
- To ensure a comprehensive and accurate assessment of the digital divide, the study excluded the digital divide's skills, cognitive, motivational factors, and skills measures. Additionally, the study did not focus on the consumer perspective of the adoption and use of technologies.
- Moreover, the study did not focus on the role of the digital divide and social cohesion from a regulation, policymakers, or government perspective. Inequality and political measures of social cohesion were also excluded from the study.
- The study's primary data collection approach ensured the accuracy and relevance of the results. The study excluded any secondary data on the digital divide and social cohesion.

1.8 Assumptions

The researcher held the following assumptions concerning the study:

- The digital divide exists in South Africa. All levels of the digital divide, namely access, use and benefits associated with being online, have yet to be addressed and bridged. To some extent, the first level of the digital divide has been partially attained; however, some individuals within the South African population still need access to the internet, especially in the underserved and rural communities and are, therefore, digitally excluded.
- Internet access does not equate to using and having the necessary skills to benefit from being online.
- There is a relationship between the digital divide and social cohesion. The digital divide affects the attainment of social cohesion.
- Socio-economic factors drive the digital divide and social cohesion, further perpetuating and hindering the latter's attainment.
- Inhibitors of social cohesion in South Africa (i.e., Disparities in income and digital inclusion) are related to race, education, geographic location, literacy levels, age, and gender.
- Most people understand the digital divide but do not have a theoretical and academic understanding of the extent of the problem.

1.9 Definition of Terms

Digital inequality: is defined as the disparity among individuals with formal access to the Internet.

Digital divide: is the disparity between the haves and have-not about access, use, skills, and benefits of information technologies communication.

Social cohesion: is defined as the glue that binds society together. “A society” is "cohesive" if it works towards the well-being of all its members, fights exclusion and marginalisation, creates a sense of belonging, promotes trust, and offers its members still needed opportunity of upward social mobility" (OECD, 2011, p. 51).

Socio-economic factors: Socio-economic status is "a composite measure that typically incorporates economic status, measured by income; social status, measured by education; and workstations, measured by occupation" (Dutton & Levine, 1989, p. 30). In the current study, the following are used to measure socio-economic factors, income, age, gender, income, population group and geographic location.

1.10 Thesis Outline

Chapter One: provides the purpose and background of the study. The research problem, research questions, and hypotheses are presented. The significance and rationale of the study are discussed in the study's Contribution to the Advancement of Knowledge section. In addition, the assumptions and delimitations informing the study are discussed. The chapter concludes with higher-level definitions of the constructs of the study.

Chapter Two: outlines the empirical literature on the digital divide, social cohesion, and theoretical frameworks underpinning the study. The chapter starts with defining each construct, then operationalising the constructs, some measures used, and their dimensions. The systems theory is the theoretical framework that underpins the study. Ecological systems theory explored the relationship between social cohesion and the digital divide. In addition to the ecological systems theory, the resources appropriation theory was used to assess the relationship between the digital divide and socio-economic factors. Social-categorisation theory was used to measure social cohesion and socio-economic factors. The chapter concludes with a conceptual framework of the study.

Chapter Three: The methodology of the study is discussed. The study adopted a concurrent mixed-method approach, and based on that, qualitative and quantitative methods were used for the data collection. The chapter begins with the philosophical underpinning of the study, pragmatism, and the ontological and epistemological view of the research discussed. This is followed by an in-depth overview of the mixed-method approach; the concurrent mixed-method approach adopted is discussed. The

data collection and analysis methods used for each study phase are discussed. The quality and rigour issues and the ethical considerations are also discussed.

Chapter Four: discusses the quantitative results of the first and second research questions. The demographics and descriptive statistics are presented first. This is followed by factor analysis and reliability assessment. Finally, the inferential statistics and data modelling conducted as part of the data analysis are presented last.

Chapter Five: The findings from the qualitative phase are presented based on the interviews conducted with the different public members—a hybrid method of inductive and deductive processes for theme development and analysis was used. The themes of the study are presented, and the main findings of the qualitative phase are presented.

Chapter Six: discusses the research findings in Chapters Four and Five concerning the study's research questions in Chapter One and considers the theoretical frameworks in Chapter Two.

Chapter Seven: presents the conclusion, recommendations, and suggestions for future studies. These aspects are presented and examined concerning the study's research questions.

CHAPTER 2. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Introduction

The purpose of this literature review is fourfold. Firstly, it aims to provide an overview of the theoretical framework used in the study and its associated hypothesis development. Following this, the chapter delves into an empirical discussion of the literature on the digital divide and social cohesion, exploring the various dimensions associated with each construct in sections 2.5 and 2.6, respectively. The focus then shifts to global research that assesses the socio-economic drivers of both constructs separately in section 2.7 before providing a South African research context on the digital divide and social cohesion in section 2.8. Finally, the chapter concludes with the presentation of the conceptual framework in section 2.9.

A variety of seminal literature was sourced and evaluated to compile this study. Peer-reviewed articles on the two constructs were examined, focusing on global trends and research conducted with developing nations and the African context on the digital divide and social cohesion. A mixed approach was employed to locate literature, including searching through various databases such as Science Direct, EBSCOhost, and Google Scholar using the key constructs of the study as search items and using a Boolean approach with keywords for literature searching. Additionally, articles were located from the reference lists of already retrieved articles. Once retrieved, the articles were reviewed, evaluated, and synthesized.

2.2 Systems theory

This research is informed by the following theoretical framework: ecological systems theory, social categorisation, and resource appropriation theory. The ecological systems theory is the overarching theory of the study and has been employed to assess the relationship between the digital divide and social cohesion. In addition, the study used the resources appropriation theory for the digital divide and the social-categorisation theory for social cohesion. The diagram below shows a graphical

presentation of the study's theoretical framework. The pertinent characteristics of the main theories that inform the theoretical framework are discussed.

Understanding the difference between the theory and theoretical framework is essential to understanding the theoretical framework underpinning this study. A theory is a collection of interrelated constructs, definitions, and propositions that present a systematic view of phenomena by specifying relations among variables to explain and predict the phenomena. Ary et al. (1990) argue that the purpose of the theory is threefold. A theory condenses and puts in order the existing knowledge in an area; it seeks to clarify and give meaning to previously isolated empirical findings and provides a provisional explanation for observed events and relationships. A theoretical framework is the systematic ordering of ideas about the phenomena investigated or a systematic account of the relations among variables (Camp, 2001; Kivunja, 2018; Warmbrod, 1986).

Examining discipline-based literature related to the topic and identifying an overarching theory explains the central hypothesis or proposition (Ivankova et al., 2006). It is, therefore, comparable to the frame of the house. Just as the foundation supports a house, a theoretical framework provides a rationale for predicting the relationships among research study variables. The theoretical framework of the study refers to a theory the researcher chooses—a blueprint guide for research (Camp, 2001). The theoretical framework is essential because it provides structure to the research and assists the researcher in situating and contextualising theories informing the study. It also focuses on the study and guides the research process.

Numerous other theories or frameworks could provide different or contradictory explanations for the relationship between the digital divide and social cohesion. However, the study draws on the theoretical ecological systems theory, social categorisation theory and resource appropriation theory as underpinnings measuring social cohesion, socio-economic factors and the digital divide. The ecological systems theory is used to understand how the digital divide and social cohesion affect the different parts of the system, thus the micro and macro factors. Social categorisation theory is used to understand how social identification through gender, age,

geographical location, education and economic activity affects the attainment of social cohesion. Finally, the resources appropriation theory is used to understand how the personal and positional categories affect the internet and ICT device use, access and benefits associated with being online.

2.2.1 *Systems theory*

This study examines the relationship between social cohesion, the digital divide, and their respective socio-economic drivers in South Africa. The term "nexus" signifies their intersection. As per Walby's (2007, p. 452) argument, intersectionality is a concept that describes the relationship between different forms of social inequality. The study aims to explore the intersection of two significant social issues, the digital divide and social cohesion, which are both intricate. Finding a suitable theoretical framework to understand them posed a challenge. As Walby (2007, p. 452-453) further stated, "Complex inequalities cannot be treated as if they are to be added up because they can also change each other." One of the study's assumptions is that the digital divide affects the attainment of social cohesion, and similarly, social cohesion plays a role in digital inclusion.

Additionally, socio-economic factors contribute to the digital divide and hinder the achievement of social harmony. This perspective aligns with Walby's (2000) assertion that social cohesion and the digital divide can mutually affect one another. This view forms the fundamental premise of the study and justifies the utilization of the term "nexus" to comprehend the intricacies of their interrelationship. The study adopts a systems theory, specifically the ecological systems theory, to delve deeper into the complexity associated with the constructs.

2.2.2 *Systems*

The study is underpinned by systems theory, specifically a branch called the ecological systems theory. The ecological systems theory was deemed appropriate for understanding the complex nexus between social cohesion and the digital divide. In order to understand systems theory, the term “systems” will be delineated first. Several definitions of systems have been proposed and explored in literature. One of the

founders of system theory defines “systems as a set of elements standing in interrelation among themselves and with the environment” (Von Bertalanffy, 1972, p. 417). This definition is like that of Arnold and Wade (2015), who argue, “A system is a group or combination of interrelated, interdependent, or interacting elements forming collective entities” (Arnold & Wade, 2015, p. 675). Both definitions emphasise the interrelationship between the different elements of a system. Meadows (2008, p. 13) offers a different view and argues that “a system is not just any collection of things. A system is an interconnected set of coherently organised elements to achieve something”. Based on her definition, she argues that elements, interconnections and a function or purpose must inform a system. Another interesting definition of a system is by Cabrera et al. (2008, p. 301), who posits that “commonly understood meanings of “system” generally refer to a “complex whole of related parts”—whether it is biological (e.g. an ecosystem), structural (e.g. a railway system), organised ideas (e.g. the democratic system), or any other assemblage of components comprising a whole”. “A system is established based on the structure and patterns of the relationships emerging from interactions among components. As a “result of these emergent patterns and relationships, each system is different from another” (Lai & Huili Lin, 2017, p. 3). Although the literature provides a nuanced view of what the term system means and entails, there are similarities, as presented above.

Systems, in the context of systems thinking, are not the reality; they are social constructs, logical conceptual constructions resulting from the interaction between our culture, perspectives and objectives on the one side and the reality on the other. “It is we who define the system and its boundaries, that is, which variables are to be included in the system and which are not” (Gallo, 2013, p. 159). The above definition of the systems as a social construct, as Gallo (2013) presents, is adopted in the study to argue for the intersection between social cohesion and the digital divide. A system is also dynamic because it changes over time. “Dynamics refers to studying the systems in the change process” (Warren et al.,1998, p. 358). System changes can be either linear or non-linear; the former is concerned with a straight-line change where one change in part A influences a change in part B. The latter refers to a non-traditional change which does not follow a certain pattern like the linear change. The digital divide can be assumed to follow a non-linear change influenced by other systems. Different

dynamics inform the digital divide; some refer to these as the levels or dimensions. The issues with these dynamics are complex and contextual. The same can be said with social cohesion; it is complex and, therefore, understood better through non-linear change. The cause-effect, a linear change, does not apply to understanding the digital divide and social cohesion. As presented above, both terms have been difficult to operationalise due to the variations in their understanding. It has also been established in the first part of this chapter that different socio-economic factors may drive both constructs, which are different and are sometimes context and country specific.

Over the years, there has been an increase in the use and application of systems theories. Although initially conceptualised in the basic sciences, it has become applicable to other disciplines, such as social sciences, management, and information science, to name a few. For this reason, Von Bertalanffy (1972) argues that the increased expansion of systems thinking resulted in the spotlight and scrutiny of general systems theory. Some scholars argue that systems theory needs to be more abstract and offer concrete solutions for real-world problems. However, the application of systems theory in social and behavioural sciences has proven otherwise. Against this background, this study is informed by the ecological systems theory. However, it is important to provide an overview of systems theory before delving into the ecological systems theory.

2.2.3 *Systems theory*

Adams et al. (2014) posit that systems theory has no universal definition. This view is supported by other researchers who argue that systems theory needs to be further explored in social science and research in general. “Defining what we mean by systems theory, or the systems approach is virtually impossible outside the context of a particular discipline. We might almost say there are as many versions of systems theory as would-be systems theorists” (Langlois, 1983, p. 581). This view is also supported by other authors who argue that, given its nature, it can be applied to different contexts and disciplines. For example, Von Bertalanffy (1972) argues that system theory has different interpretations and permutations, which is often problematic. His argument further highlights the lack of consensus on what systems

theory is. On the other end, different nuances or branches of systems theories are said to be complimentary. They all are dominated by the systematic view of the world from the lens of different disciplines. Systems theory aims to explicate dynamic relationships and interdependence between components of the system and the organization–environment relationships.

There are different approaches to systems theories, namely general systems theory, which argues that it is fundamental to all systems theoretical approaches. Other branches of systems theory include cybernetics, evolutionary systems theory (Laszlo, 1987), network theory, control theory, and ecological systems theory, to name a few. Although systems theory lacks a universal definition; however, it has been successfully applied as a lens in interdisciplinary research. The next section discusses and argues general and ecological systems theories. Furthermore, the rationale for using the latter as a theoretical lens in understanding the relationship between the digital divide and social cohesion and the socio-economic factors influencing them is discussed. The use of systems theory in the study is supported by (Ritzer and Stepnisky, 2021) on the benefits of systems theory in the social and management sciences. He argues that systems theory has six benefits, which will be discussed below.

Firstly, systems theory, originating from the hard sciences and believed to apply to all behavioural and social sciences, offers the potential for a shared terminology that can unify these diverse fields. This common vocabulary enables interdisciplinary communication and understanding (Ritzer & Stepnisky, 2021). Thus, it was deemed appropriate in the current study because of the nuanced view and application in diverse fields of study. Secondly, systems theory is characterized by its multileveled nature, allowing it to be effectively applied to both macro and micro levels, objective and subjective aspects of the social world. It offers a framework encompassing various phenomena within the social sciences. The current study adopted systems theory because of its multileveled nature in understanding phenomena (Ritzer & Stepnisky, 2021). Both social cohesion and the digital divide are complex constructs that can be better understood through their multileveled nature. Thus, at both micro and macro levels. Thirdly, systems theory emphasises the interconnectedness and interdependencies among various aspects of the social world. Rather than

approaching social analysis in a fragmented manner, systems theory encourages a holistic perspective that considers the relationships and interactions among different components. This approach opposes reductionist or isolated analyses of social phenomena (Ritzer & Stepnisky, 2021). As per the study's title, the current research sought to understand the nexus or interconnection of social cohesion and the digital divide, and systems theory offers that understanding. Fourthly, the systems approach within systems theory views all sociocultural systems as dynamic processes, particularly emphasizing the role of information and communication networks (Ritzer & Stepnisky, 2021). It recognizes that interactions and information flows are integral to understanding sociocultural phenomena.

Fifthly, one of the significant strengths of systems theory is its inherent integrative nature. It seeks to bring together various components and perspectives within the social world, promoting a holistic understanding that transcends disciplinary boundaries (Ritzer & Stepnisky, 2021). This integrative approach comprehensively analyses complex social phenomena such as the digital divide and social cohesion. Finally, systems theory dynamically perceives the social world, emphasising sociocultural systems' ever-changing nature. It is concerned with understanding and explaining the emergence and ongoing dynamics of sociocultural phenomena. This dynamic perspective acknowledges that social systems constantly evolve and highlights the importance of studying their transformative processes.

Systems theorists reject the idea that society or other large-scale components of society should be treated as unified social facts. Instead, the focus is on relationships or processes at various levels within the social system (Ritzer & Stepnisky, 2021, pp. 331-332). It is against this view that the systems theory has been adopted and used to understand the relationship between social cohesion and the digital divide. This section will now focus on the two main sub-areas of systems theory, namely the general systems theory and the ecological systems theory, in building the foundation and justification for the latter.

2.2.4 *General systems theory*

According to the field of general systems theory, there are three domains: systems science, technology, and philosophy. Von Bertalanffy (1972), one of the pioneers of this theory, argues that its focus is on the concept of "wholeness" and the larger picture. He also suggests that general systems theory serves as a tool for identifying previously overlooked phenomena, much like any scientific theory or broader compass. As he puts it, the theory "is concerned with and tries to give its answer to perennial problems of philosophy" (Von Bertalanffy, 1972, p. 424). General Systems Theory, according to Boulding (1956), refers to a level of theoretical model-building that falls somewhere between the highly generalised constructions of pure mathematics and the specific theories of the specialised disciplines. In this study, however, the ecological systems theory was used to explore the intricate link between social cohesion and the digital divide, rather than relying solely on the general systems theory that is common in systems research literature.

2.2.5 *Ecological systems theory*

Ecological systems theory, first developed by Bronfenbrenner, is often associated with his earlier work on development, making him widely recognised as the father of the theory. According to Bronfenbrenner's 1979 research, each system is born from a setting defined as "a location where people can readily engage in face-to-face interaction." This theory's unique conceptual framework describes people's embeddedness in their environments, with our social and physical world essential to our existence. Ecological systems theory can be utilised to understand human phenomena, such as the digital divide and social cohesion (Härkönen, 2001; Rothery, 2008). Bronfenbrenner (1979) identifies four domains, referred to as "systems," that can be used to view the world. Understanding the different nested systems of the theory, such as microsystem, mesosystem, exosystem, and macrosystem, is crucial in comprehending the drivers of social cohesion and the digital divide.

Microsystems

Bronfenbrenner's theory outlines various levels of environmental influence on an individual's development, starting with microsystems. Microsystems refer to face-to-

face settings where individuals engage in activities, social roles and interpersonal relations shaped by physical, social and symbolic features. The interplay between different factors in an individual's immediate environment, such as their family and community and the broader societal landscape, impacts their well-being and social cohesion. Changes or conflicts within one system layer can have ripple effects on other layers. The digital divide and access to information and technologies (ICT) are also influenced" by various factors at the individual level, such as age, gender, population group, economic activity, and geographical location. Individual factors collectively shape an individual's digital access and social cohesion.

Mesosystems

The second level is the mesosystem, which comprises the linkages and processes between two or more settings containing the developing person (e.g., the relations between individuals', school and workplace) (Bronfenbrenner, 1994, p.40). The mesosystem involves the individual's attempt to comprehend themselves and their environment, considering how it can positively or negatively affect their lives. Individual technologies play a vital role in enabling individuals to thrive within their surroundings, and a similar argument can be made regarding social cohesion.

Exosystems

According to Bronfenbrenner (1994, p.40), exosystems refer to the connections and actions between two or more environments, with at least one being outside the immediate setting of the developing person. These external factors can indirectly impact the individual's experiences within their immediate surroundings, such as a child's home life and the individual's workplace or a parent's relationship with their neighbourhood peer group and their child's school. These influences can significantly impact an individual's social cohesion and digital inclusion within their micro and mesosystems. Additionally, these factors can affect an individual's adherence to traditional beliefs or cultural heritage.

Macrosystems

The macrosystem encompasses the larger patterns of micro, meso, and exosystem that define a specific culture or sub-culture. It includes belief systems, knowledge

bases, material resources, customer preferences, lifestyles, opportunities, hazards, and life course options embedded in these broader systems. Essentially, the macro system serves as a societal blueprint for a culture or sub-culture. Macro-level systems concentrate on the bigger issues that have individuals and influence these systems, such as government policies and related matters**.**

The use of Bronfenbrenner's ecological systems theory is pivotal for individuals, strengthening the correlation between social cohesion and the digital divide. This theory enables a holistic examination of the nested systems involved in both concepts, resulting in a comprehensive view of their relationship. The study acknowledges the significance of considering multiple levels of influence by focusing on the micro and macro systems of the digital divide and social cohesion. This approach recognises that individuals are not solely shaped by their immediate surroundings but are also influenced by broader societal factors. Through the exploration of various systems, including the micro (individual level), meso (intermediate level), exo (community level), and macro (societal level), the study aims to capture the intricacies and interactions between these systems in understanding the relation between social cohesion and the digital divide.

Furthermore, the study's emphasis on the digital divide and socio-economic factors as contributors to undermining social cohesion demonstrates an understanding of the multidimensional nature of these constructs. The digital divide can have far-reaching effects on individuals and households, impacting their opportunities, resources, and access to information and communication technologies. By studying these factors holistically, considering their interconnections and examining the various systems at play, the study aims to comprehensively understand their role in shaping social cohesion. The study's adoption of the ecological systems theory allows for a comprehensive exploration of the relationship between the digital divide and social cohesion. By studying micro, meso, exo, and macro systems and considering the multidimensional aspects of the digital divide, the study seeks to provide valuable insights into the dynamics at play and contribute to a more nuanced understanding of these significant issues.

The digital divide and social cohesion are quite complex and require a thorough examination of the intricate constructs. A systems theory approach is necessary to understand these complexities, emphasising ecological systems theory. While the current study is primarily done with the mesosystem, it is important to recognise that this system is intricately connected to other systems, leading to its inherent complexity. Furthermore, this study aims to test the hypothesis below to gain valuable insights into the interactions between social cohesion and the digital divide.

2.2.6 *The relationship between social cohesion and the digital divide*

This section delves into the existing literature that explores the correlation between the digital divide and social cohesion. Specifically, we highlight the studies that have analysed this relationship from a utopian and pessimistic perspective (Beckers et al., 2003). The utopian viewpoint emphasises the potential for technology to enhance social cohesion, while the pessimistic viewpoint raises concerns about technology's negative impact on social cohesion. As a result, research on the connection between social cohesion and the digital divide is often interpreted through these contrasting lenses.

A study by Beckers et al. (2003) explored the impact of ICT on social cohesion in Amsterdam. The findings revealed that frequent ICT users tend to have more social contacts, leading to increased social cohesion. The results neither support a pessimistic nor utopian view of using ICT to curb technology. Williams (2009) conducted another study to examine the relationship between internet access and social cohesion in New Zealand's local communities. The study utilised two case studies, and it was concluded that access to the internet is positively associated with social cohesion.

In addition, research into community-level internet access has revealed that it can promote stronger connections within local neighbourhoods (Hampton, 2010). Similarly, Balkan and Adalier (2011) explored the link between social cohesion and computer and internet usage in university students, finding a noteworthy relationship.

No significant connections were found between daily computer usage or the extent of internet usage and social cohesion (Balkan & Adalier, 2011).

Research has shown that online interaction and networking can positively impact social cohesion. For instance, Marlowe and colleagues (2017) discovered that social media platforms can foster a sense of belonging, friendship, and family ties - crucial aspects of social participation and cohesion. Similarly, Wallace et al. (2017) found that Information and Communications Technology can bridge social divides and promote social cohesion, especially in rural areas. These findings suggest that digital inclusion can be vital in promoting social cohesion.

Several studies have used systems theory to understand social cohesion. Vergolini (2011) examined the relationship between social cohesion and social inequalities in Europe, while Norton and De Haan (2012) explored the link between social cohesion and employment through systems theory. Bottoni (2018) argued that different layers of the systems theory, namely micro (interpersonal trust and social relations), meso (openness and participation), and macro (trust and legitimacy of institutions), can help us understand the various dimensions of social cohesion. Against this backdrop, the hypothesis below was tested:

- $H_0$1: There is a relationship between the digital divide and social cohesion.

2.3 Social categorisation theory

The study uses social categorisation theory to explore the correlation between social cohesion and socio-economic factors. This theory stems from the social identity theory developed by Tajfel and Turner (1979), which suggests that people strive to maintain a positive social identity by associating themselves with specific groups and distinguishing themselves from others (Tajfel, 1979). Social identity theory is individuals' perception of themselves based on their membership in particular social groups and greatly emphasises how the social context influences intergroup relations. Interestingly, the ideas were developed using the "minimal group paradigm," which

stripped away all context (Hornsey, 2008, p.205). The social categorisation theory emerged from the social identity theory.

According to social-categorisation theory, an individual's behaviour is influenced by social or personal identity processes, depending on the significance of a particular situation for their identity (Trepte and Loy, 2017). In South Africa, social cohesion is closely linked to social and personal identity (Burns et al., 2018), making social categorisation theory a useful framework for studying and measuring social cohesion. The three principles of social categorisation theory further support its applicability in this context.

1. Humans are not merely individuals, and neither are our minds. Individuals, groups, and intergroup relations exist. Humans are individuals and group members who have personal and social identities.
2. Individuals can define and categorise themselves at various levels of abstraction. This may include identifying as an individual, as a member of specific groups compared to others, or as part of broader, more encompassing groups. These more comprehensive self-identifications determine what is socially accepted and acknowledged as significant, suitable, and correct. Salience explains how a situation (including the self) is categorised and given 'meaning'. How the perceiver categorises and understands the situation will determine self-perception and behaviour (Turne et al., 2011).

The concept of social categorisation theory has been widely utilised across various fields. It has proven useful in comprehending organisational culture climate (Chatman & Spataro, 2005) and marketing (Demiray & Burnaz, 2019). According to SCT, individuals possess multiple personal and social identities arranged in a category hierarchy. The level at which one categorises oneself at any given moment depends on the specific social context in which one finds themselves. This is a cognitive process driven by the principle of meta-contrast, which prioritises categorisation at a level in the hierarchy that maximises between-category differences while minimising within-category differences in the given context. Additionally, it depends on the perceiver's normative beliefs about the categories involved, the stimuli present in the current

social situation, and their readiness to use a particular categorisation (Barrett et al., 2004, p.5).

- $H_0$2: There is a relationship between socio-economic factors and social cohesion.

2.4 Resources appropriation theory

The Resource Appropriation Theory (RAT) was developed to address the lack of theoretical foundations behind the digital divide (Van Dijk, 2005). According to the RAT, the digital divide is shaped by a relational view of inequality, which offers several advantages (Van Dijk, 2013). These include a better understanding of different views on technology appropriation, a distinction between various types of inequality, a lack of prioritization of pairs, and insights into personal, positional, and resource types.

The RAT posits that unequal distribution and appropriation of resources create and perpetuate the digital divide. It suggests that proper access to ICT or digital products benefits those who are more privileged and knowledgeable than those who are not (Van Dijk, 2005). Moreover, absolute inequalities in society, such as gender and age, contribute to an unequal distribution of resources. As per Van Dyk (2005, 2013), unequal access to digital technologies is the primary reason for the unequal distribution of resources and categorical inequalities. The Resource Appropriation Theory covers five domains, including personal and positional categories, resource distribution, technological appropriation, access to ICT, and participation in society.

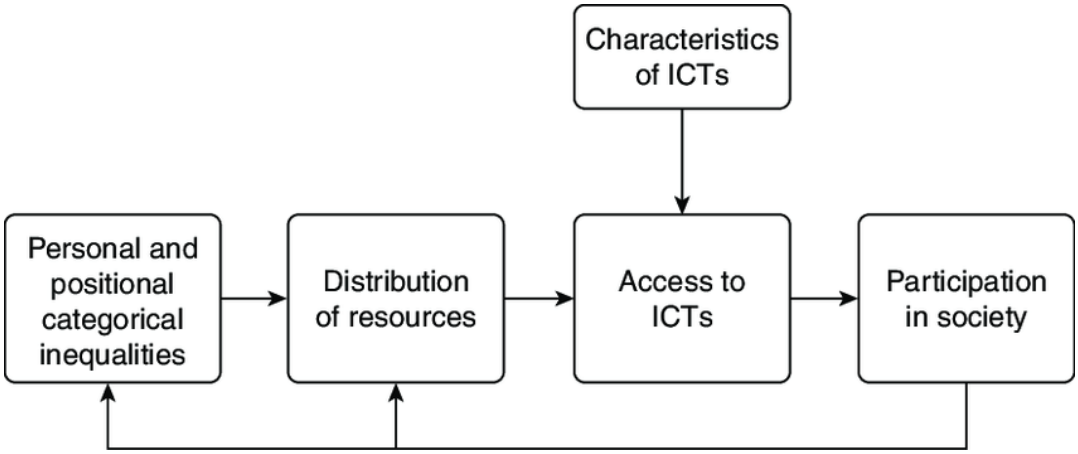

Figure 2-1 Five tenets of Resource Appropriation Theory Resource Appropriation Theory - Adapted from Van Dijk, (2005, p. 15).

Van Dijk (2005) developed the resource appropriation theory in response to the absence of the theoretical underpinning informing the digital divide. Figure 2-1 above shows the five tenets of the RAT, namely personal and positional categorical: inequalities, distribution of resources, characteristics of ICTs, Access to ICTs and participation in society. According to resources appropriation theory. The resources appropriation theory is based on five tenets (Van Dijk, 2005,p.15):

1. Categorical inequalities in society produce unequal access to digital technology.
2. Equal access to the distribution of resources causes unequal access to digital technologies.
3. Unequal access to digital technologies also depends on the characteristics of these technologies.
4. Unequal access to digital technologies brings about unequal participation in society.
5. Unequal participation in society reinforces categorical inequalities and unequal distribution of resources.

2.4.1 *Personal and positional categorical inequalities*

The existence of a digital divide can be traced back to the unequal distribution and acquisition of resources. According to van Dijk's theory (2005), individuals who are

quick to adopt ICT products tend to benefit more and enjoy greater privileges than those who do not. This implies that being at the forefront of technology access confers advantages. Additionally, van Dijk (2005) argues that absolute inequalities in society, such as gender and age, contribute to an uneven distribution of resources. Unequal access to digital technologies is identified as the primary reason for the uneven distribution of resources resulting from categorical inequalities (van Dijk, 2005).

Van Dijk (2005) argues that personal and positional categories are fundamental in understanding the digital divide. The personal categories include age (young or old), gender or sex (male or female, non-binary), race, intelligence (cognitive, emotional, and social) level, and personality (introvert or extrovert). The latter focuses on labour, households, nationality, and education level. For the current study, personal and positional categories were used. Only the following personal categories were used: age, gender, sex, and race. They were assessed in the study; cognitive level and personality were omitted. In addition, the study explored the following positional categories: educational level and economic status.

2.4.2 *Resources and mechanism of distribution*

According to Van Dijk, one's access to innovative technologies is not determined solely by personal or positional factors but rather by the availability of resources. The distribution of resources, including time, materials, mental capacity, social connections, and cultural background, creates an unequal playing field (Van Dijk, 2006, p. 18). He identifies three mechanisms of distribution that contribute to this inequality: social exclusion, exploitation, and control.

2.4.3 *Technology appropriation*

The appropriation of technology is determined by various factors such as attitude, material access, skills, and usage of digital technologies. Attitude pertains to how individuals approach using ICT or digital technologies and accessing the necessary materials. Skills are crucial in effectively utilizing these technologies. Therefore, it is assumed that individuals possess the technical know-how. Usage extends beyond mere access to the actual utilization of these technologies. The study also examines

the digital divide, focusing on the different levels. The first level deals with access, while the second encompasses usage and skills. For this study, the second level only delved into internet and mobile phone usage, while the skills aspect needed to be explored.

2.4.4 *Participation in Society*

The concept of participation in society pertains to how individuals utilise digital technologies or ICT to gain benefits for themselves and their communities. This includes assessing how people use these tools to manage their lives and optimally engage with others. Participation in society is closely tied to the third tier of the digital divide, which refers to the benefits of being connected online. This level is studied to understand better how individuals can reap the rewards of being connected. Van Dijk (2006) describes this as the "benefit of access," which enables participation in all aspects of society. However, this theory has some limitations, as it needs to fully account for the cognitive and behavioural factors that drive people to use the internet. It also fails to consider personal and positional categories and resource availability. The table below connects the dimensions of the digital divide with the principles of the RAT theory, which were utilised in the present study.

Table2-1 RAT and levels of the digital divide Adapted from Van Dijk, (2005)

RAT	**Dimension**
Personal, positional resources and mechanism of distribution	First-level digital divide
Access to ICT	Second–level digital divide
Participation in society	Third-level digital divide

The digital divide is a complex issue that goes beyond mere access to technology. It also encompasses access to digital literacy and skills, as well as social and cultural factors such as language barriers and lack of cultural relevance in technology. Even if individuals have access to technology, they may not have the necessary knowledge and skills to use it effectively. Additionally, cultural and religious biases and barriers are often overlooked in scientific discussions of the digital divide. Therefore, it is crucial

to approach this issue from a holistic perspective. Based on the theory presented above, the following was hypothesised:

- $H_0$3: There is a relationship between socio-economic factors and the three levels of the digital divide.

Based on the third hypothesis, the following three sub-hypotheses were formulated:

- $H_0$3a: There is a relationship between the socio-economic factors and internet access (first-level digital divide).
- $H_0$3b: There is a relationship between socio-economic factors and internet usage (second-level digital divide).
- $H_0$3c There is a relationship between the socio-economic factors and benefits of being online (third-level digital divide).

2.5 The Digital Divide

The literature on the digital divide presents differing perspectives and ongoing debates regarding its origins, definitions, and implications (Hargittai, 2003; Norris, 2001; Rogers, 2001; Van Dijk, 2006, 2020). Larry Irvin, a former assistant secretary of commerce for communications and information, is often cited as a key figure in the origins of this phenomenon (Rogers, 2001; Gunkel, 2003; van dijk). However, as interest in the digital divide has grown since the early 2000s, numerous definitions and explanations have emerged in academic literature. As a result, the digital divide is now recognised as a complex and multi-dimensional issue, with various perspectives and insights offered by scholars and authors.

Hargittai's (2003) definition of the digital divide refers to the gap between those with access to digital technologies and those without. This perspective is commonly acknowledged in literature, but Rogers (2001) argues that the digital divide is defined by the discrepancy between individuals who benefit from internet access and those who do not. As the term has developed, the concept has expanded to encompass internet access and other forms of information technology. Several organisations, including the Organisation for Economic Co-operation and Development, have comprehensively defined the digital divide. It is important to note that as our

understanding of this phenomenon has evolved, so too have our measures for assessing it.

The digital divide has been interpreted in various ways, but the OECD's 2001 definition offers a comprehensive overview that does not categorise the divide into distinct categories. The definition defines the digital divide as the inequality between individuals, households, businesses, and geographic locations at different socio-economic levels regarding their access to information and communication technologies (ICTs) and their Internet use for various purposes (OECD, 2001, p.5). It is worth noting that this definition considers three critical factors: individual, social, and economic. The issue of digital inclusion is complex, encompassing everything from accessing information and communication to conducting business activities and transactions. The OECD's definition is one of the most comprehensive explanations of the digital divide available.

Van Dijk (2005), a renowned scholar in the field of digital divide literature, initially proposed a simple definition of the digital divide as "the gap between those who have access to computers and the internet, and those who do not" (p.6). However, in later works, Van Dijk (2012) expanded this definition to include usage and skills. According to Van Dijk (2005), the digital divide is caused by inequality in personal and positional categories, access to ICT, and participation in society. To better comprehend this phenomenon, Van Dijk developed the Resources Appropriation Theory (RAT), which will be further explored in section 2.5 when discussing the theoretical framework of the digital divide. Furthermore, van Dijk (2017) argues that the theoretical foundations and development of the digital divide is still in this infancy stage.

The current discourse surrounding the digital divide has shifted from a binary view of internet access to a more nuanced understanding of meaningful connectivity. This concept, as defined by Gong (2020, p. 8), considers a spectrum of multi-dimensional factors contributing to a person's ability to engage with the internet fully. These factors include regular and uninterrupted access, appropriate devices, adequate data, affordability, and fast connection speeds. It is worth noting that the terms digital divide, digital disparity, and digital exclusion are often used interchangeably in literature.

However, Hargittai (2008) distinguishes between the digital divide, which focuses on unequal access to technology, and digital inequality, which encompasses a wider range of differences related to ICT use. Though these terms are related, their interchangeable use can create challenges when operationalising and measuring the digital divide. It is important to clarify that, for this study, the term digital divide will be used. We will explore the operationalisation of this term in Chapter Three.

A common topic in discussions surrounding the digital divide is "technological determinism". This concept explores the interplay between technology and society and suggests that technology can shape and dictate the structure of culture and society. It proposes that technological advancements can impact institutions and even art and religion. However, an opposing viewpoint, "technological neutrality, " argues that technology and humans can coexist without negative consequences. Technology can even help address societal and health issues, improving well-being. While some argue that the digital divide is a social issue and not a technological one, it is important to acknowledge that technology can play a role in exacerbating existing inequalities. Evidence suggests that technological developments can perpetuate social stratification and contribute to the digital divide. While some argue that technology does not create new social inequalities, it can replicate current ones and build upon existing social exclusion through technology. It is crucial to recognise that the digital divide, fuelled by insufficient access to and use of digital technology, has the potential to sustain and exacerbate current social inequalities. Moreover, the prevailing socio-economic conditions can exacerbate the digital divide.

Over time, extensive research has been conducted to investigate and comprehend the digital divide phenomenon. The definition of the digital divide has expanded to include skills, usage, and tangible outcomes (Hargittai, 2003; Van Deursen et al., 2014; Van Deursen & Helsper, 2018). The focus of this research has been on the digital divide, which emphasises the privileged over the underprivileged regarding digital technology, specifically outcomes versus opportunities, a term that is widely used in the context of economic disparities. This perspective of the digital divide centres on those with material privilege with access to the internet, mobile phones, and computers, leading to better skills and frequent use of these devices, leading to quantifiable outcomes and

offline benefits compared to the unprivileged. Rogers (2001) identifies three fundamental reasons for the digital divide: the lack of telephone and computer access to the Internet and socio-economic characteristics such as age, gender, and income. The first reason is already widely discussed in the previous sections. The second and third reasons are related to socio-economic characteristics. Therefore, the third reason argues for education, socio-economic status and learning inequality. Research on digital inequality has focused on these issues, but measuring the digital divide in isolation from socio-economic characteristics is almost impossible.

In digital divide research, scholars have largely utilised the Digital Development Index (DDI) to assess progress (Meddour et al., 2011; Telecommunications-UIT, 2017; ITU, 2023). The DDI relies on four key indicators to gauge digital development on a country-wide scale: networks, skills, uptake, and intensity. Networks encompass fixed telephone lines, internet availability, and cable and wireless internet infrastructure. Meanwhile, skills consider literacy rates, educational attainment, and school enrolment. Uptake focuses on computer usage, internet penetration, households with internet access, and individuals who own smartphones. Finally, intensity measures broadband subscription rates and internet traffic. The methodology section of this research will provide a detailed breakdown and is primarily concerned with the third research objective.

According to Barzilai-Nahon (2006), measuring the digital divide can be done differently. They argue that it is important to consider the context of each country rather than applying a one-size-fits-all approach. The digital inequality index should consider each country's unique factors and diversity. Barzilai-Nahon (2006) also suggests that countries with less infrastructure should prioritize infrastructure factors, while those with functional connectivity should focus on other factors. Viewing the internet as a social and political space when conceptualizing the digital divide is crucial, as ignoring this aspect would limit its usefulness.

Cruz-Jesus et al. (2012) highlights the complexity of measuring access to ICT diffusion. The absence of a standard definition of digital development, information society, and digital inequality, along with inconsistent and unharmonized data, make

the task challenging. Additionally, there is a trade-off between the depth and width of the analysis of digital inequality. Several studies have evaluated the common indexes used in digital inequality research, such as the Information ICT-OI and ICT Development Index (Caidi & Allard, 2005). Bruno et al. (2011) conducted a comprehensive analysis of these indexes.

Jan van Dyk (2006) is a respected authority on digital inequality, and his book "Deepening Inequality: Inequality in the Information Society" argues that current research on digital inequality is too restricted. Van Dyk contends that the focus on ITU indicators and socio-economic and demographic variables needs to be revised, and he calls for a more comprehensive assessment of digital inequality that considers material, motivation, physical, skills, and usage access. Recently, the digital divide issue has gained increased attention due to technological disruptions. In Norway, a highly digitized country, Gran et al. (2021) conducted a study on the impact of algorithmics in perpetuating the digital divide. The researchers found that those surveyed required more information on the impact of algorithms. They also argued that the gap between algorithm-aware and those who are not is widening with machine learning algorithms and related infrastructure. This widening gap disadvantages those with less awareness of the digital world.

2.5.1 *Dimensions of the digital divide*

There is a common perspective regarding the stages of driving and defining the digital divide, identified by a set of levels. This view is distinguished by what is known as the level or stages of the digital divide. According to Várallyai et al. (2015), a digital divide is a multi-dimensional approach. Mossberger et al. (2003) suggest that the digital divide can be characterized by four stages or levels: access inequality, skills inequality, economic opportunity, and democratic inequality. Ferro et al. (2011) contend that the digital divide is determined by four factors, including access, global and multi-perspective inequality. On the other hand, some scholars hold a different view and argue that digital inequality is focused on three dimensions: access, skills and usage, and tangible outcomes. This study concentrates on the three dimensions of digital inequality.

In their research, Várallyai et al. (2015) suggest that digital inequality is becoming more complex, extending beyond mere access and usage to encompass knowledge and other tangible outcomes. They propose a multi-dimensional approach, with the first dimension being largely influenced by technological determinism, which is driven by a country's infrastructure and investment. The second dimension considers socio-economic status, skills, geography, and education. According to Várallyai et al. (2015), the third dimension involves examining multiple factors such as race, gender, and age to understand how they shape users' experiences. The digital divide is a complex and multifaceted phenomenon to measure, as noted by Van Dijk and Hacker (2003). Thus, there are inconsistencies in the quantitative indicators used to measure the digital divide and a lack of standardization of the determinants of digital inequality (Vehovar, 2006; Chakraborty & Bosman, 2005; Martin, 2003; Telecommunications-UIT, 2017; Van Deursen et al., 2014; Chen & Wellman, 2004). To comprehend this phenomenon, it is crucial to thoroughly understand the measures and operational definitions of the digital divide.

According to Norris (2001), the digital divide has three distinct dimensions. These include the global divide and the social and democratic digital divides. The global divide refers to the gap in internet access between developed and developing countries. On the other hand, the social digital divide is characterized by the gap between individuals living in information-rich societies versus those residing in developing nations. Finally, the democratic digital divide relates to the discrepancy between individuals who use digital resources to engage in public life and those who do not. James (2007) offers a different perspective on the global digital divide, arguing that the extent to which various forms of information technology benefit developed countries versus emerging countries is a crucial factor to consider. The literature on the digital divide often refers to these three dimensions, which are illustrated in the table below and will be discussed in further detail.

Table 2-2 Dimensions of the digital divide

Dimension	Description	Source
First-level digital divide	• Internet and mobile phone access. • Access to ICT devices.	Montagnier and Wirthmann (2011); Van Deursen and van Dijk (2019); Warschauer (2002)
Second–level digital divide	• Internet usage and skills	Van Deursen et al. (2014); Hilbert (2016)
Third-level digital divide	• Benefits of internet access and Usage	Van Deursen and Helsper (2018); Helsper and van Deursen (2015; van Deursen et al. (2014); van Deursen and van Dijk (2014)

The first-level of the digital divide

The first level of the digital divide is characterised by a binary approach to internet access, as noted by Montagnier & Wirthmann (2011), Potter (2006), Van Deursen & van Dijk (2019), and Warschauer (2002). This level primarily concerns access to the internet, computers, and, more recently, mobile phones. According to Blignaut (2009, p. 586), *access* is having access to a computer and the internet at school, work, home, or public places. Therefore, physical access to the infrastructure of digital technologies is a significant factor. However, there is ongoing debate regarding what constitutes access. DiMaggio et al. (2004) suggest that access can be broadly defined and measured by focusing on three types: access to the internet anywhere, access in one's preferred location such as residence, and access using high-speed connections at home.

Despite the worldwide progress towards universal internet access, many developing and underdeveloped nations still need help with connectivity (DiMaggio et al., 2004; Pearce & Rice, 2013; Valadez & Duran, 2007). Additionally, access to the internet varies depending on the region, country, and level of economic development (Haight et al., 2014; Warschauer, 2002). As such, context plays a crucial role in understanding the so-called first-level digital divide. Certain developing countries are still grappling with this divide, and factors such as their economic landscape, level of development, and infrastructure are key in bridging this gap. In 2017, the ITU released a report on households with internet access, revealing that most homes in developed nations (84.4%) have access to the internet, while only 42.9% of homes in developing countries and a mere 14.7% in less developed nations reported having internet access (ITU, 2017). This disparity underscores the economic aspect of the digital divide, with the suggestion that developed countries' superior infrastructure creates a conducive environment for internet access and, in turn, leads to these nations achieving universal access over time. A strong economy enables the creation of excellent infrastructure and further technological advancements.

Access to the internet has been an ongoing topic of discussion worldwide, with a recent World Bank report showing that around 89% of the global population now has internet penetration and access. However, this number drops in regional data, particularly in Africa, where internet penetration remains low. According to Van Dijk and Hacker (2003), four barriers to access exist, including a lack of digital experience, possession of computers and network connection, digital skills due to insufficient user-friendliness, and significant usage opportunities. While infrastructure is important, studies have shown that political will is necessary for governments to enable internet access (Lenhart, 2003). Therefore, governments must develop and implement policies promoting universal internet access. The growth of ICT uptake indicators has been exponential between 2005 and 2016, including mobile cellular subscriptions, households with computers and internet access, active mobile broadband subscriptions, and individuals using the internet (ITU, 2017). However, there has been a decline in fixed telephone subscriptions globally, and the African region still needs to catch up regarding ICT product uptake.

According to research conducted by Van Deursen and Helsper (2018) and Van Deursen and Van Dijk (2018), internet access is necessary for social inclusion. The studies suggest that individuals lacking material access, including computers, mobile phones, and the internet, are often excluded from society. *Material access* was defined as owning computer devices, software, and peripheral equipment, such as printers and monitors. The researchers also noted that expenses related to hardware, peripheral repair, and licensing software for mobile electronic devices contribute to perpetuating digital inequality. It is not surprising that smartphones are the most widely used device (76%), followed by laptops (70%) and desktops (50%) (Van Deursen & Van Dijk, 2018).

Remarkable progress has been made in terms of internet and information technology access. However, there remains a significant gap between those who have access and those who do not, indicating that the initial level of digital inequality persisted in the early 2000s across both developed and underdeveloped countries, such as South Africa. Additionally, the issue of access is multifaceted. Hilbert (2016) contends that a lack of broadband access perpetuates the first level of digital inequality. In South Africa, internet access remains a concern as approximately 58% of the population has access to the internet, leaving half without this resource, according to Statistics SA. This problem is further compounded by the rollout of fibre in primarily urban areas and the impending arrival of 5G, which will only exacerbate the digital divide in the country.

The second level of the digital divide

The second level of the digital divide is influenced by two key factors, namely skills and usage. This shift is marked by a transition from mere access to the internet towards the ability to operate and utilise it effectively. Research into the second-level digital divide emphasises the importance of using skills in isolation and combination. As per Hargittai's definition (2003), skills refer to the ability to use new technologies competently and efficiently. The varying degrees of skills can be categorized into technical means, autonomy of use, social support and network, and experience. These four factors are essential in determining an individual's level of competency in utilizing the internet (Hargittai, 2003).

According to Hargittai (2002), the digital divide should not only be limited to people's online activity but also encompass their online skills. Hilbert (2016) builds on this view by suggesting that the second dimension of the digital divide is characterized by varying usage patterns influenced by cultural, demographic, and social variables. He emphasises the importance of considering usage patterns such as bandwidth while assessing internet use. In Hilbert's view, the second dimension of digital inequality should focus on usage and extend to the diffusion of bandwidth (Hilbert, 2016). Other studies have shown that digital bandwidth inequality is closely linked to income inequality, further exacerbating the digital divide (Hilbert, 2016). Several studies have shown that the digital divide is a particularly pressing issue for low-income countries.
In addition, developing countries face other factors contributing to the second-level digital divide. Scholars researching this topic argue that having universal internet access does not guarantee digital inclusion (Hargittai, 2002; Min, 2010). Individuals possess varying skills when using the internet or mobile phones.

The third level of the digital divide

The third level of the digital divide pertains to the offline advantages of internet usage, encompassing how people use it and what benefits they derive from it. According to Helsper (2015), this level refers to "the inequalities in the rewards of internet usage among populations of users who share similar usage patterns and enjoy relatively unrestricted access to ICTs and internet infrastructure" (Helsper & Van Deursen, 2015; Van Deursen, 2014). Essentially, it highlights the discrepancies in individuals' ability to leverage their internet access for positive offline outcomes (van Deursen & Helsper, 2015, p.30), encompassing the activities and advantages of using ICT products (Van Deursen, 2014).

According to research on the third level of the digital divide, internet use can drive tangible outcomes in four main areas: economic, social, cultural, and personal (Helsper & Van Deursen, 2015). However, measuring the offline benefits of internet use can be challenging, making it difficult to access this level of the divide (Van Deursen & Helsper, 2018). Recent studies have shown that frequent internet use is strongly linked to personal development and social or business activities, which can further enhance personal growth, as seen in the Nigerian population (Ogbo et al.,

2021). Although scholars have noted the difficulties in quantitatively assessing this level, they have called for more qualitative studies. It is crucial to recognise that moving from the first to the second level is necessary to appreciate the benefits of ICT access and usage. Still, it is important to note that this level perpetuates a binary view of the digital divide. While there are different outcomes related to internet use and access, they are often viewed as either beneficial or not. It is crucial to acknowledge that the use of the internet can have negative consequences, including addiction, cyberbullying, and technophobia. These issues have the potential to undermine the benefits associated with internet usage and should not be overlooked.

While research surrounding the digital divide has been substantial, the majority of it has been concentrated on the first and second dimensions (DiMaggio et al., 2004; Selwyn, 2004; Van Dijk, 2005; Blank, 2017; Hargittai, 2002; Kalmus et al., 2013; Min, 2010). However, there has been an increasing interest in the third dimension despite its relative lack of attention (Stern et al., 2009; Helsper& Van Deursen, 2015; Van Deursen, 2014; Van Dijk, 2005).

2.6 Social Cohesion

To truly grasp the concept of “social cohesion,” one must be familiar with the various evolved definitions and measures. Like income and digital inequality, social cohesion has faced criticism for its definition (Berger-Schmitt, 2000; Jenson, 1998, 2010; Jupp et al., 2007; Schiefer & Van der Noll, 2017; Stanley, 2003). Social cohesion is “the property by which whole societies, and the individuals within them, are bound together through the action of specific attitudes, behaviours, rules and institutions which rely on consensus rather than pure coercion” (Struwig et al., 2012, p.3). Friedkin (2004) argues that social cohesion manifests differently depending on its focal constructs, antecedents, and consequences. It can be analysed at both the individual and group levels. The origin of social cohesion is the subject of debate in academic literature, with some arguing that it is rooted in sociology and economics. In contrast, others view it from a policy or academic perspective. However, there is some consensus that Canada is the birthplace of the policy view and definition of social cohesion (Jenson,

1998). As a result, numerous theoretical and empirical reports have emerged to provide a better understanding of social cohesion.

Experts have debated whether social cohesion is often used as a cover-up for existing social inequalities, leading governments to use it loosely to avoid addressing these inequities (Jenson, 1998). Jenson contends that social cohesion is a kind of “quasi-concept” that exists within policy communities, citing the working definition put forth by Bernard (1999). This definition posits that these constructions are “hybrid” because they have two faces: they are based partly on an analysis of situational data, which allows them to be relatively realistic and benefit from the legitimacy conferred by the scientific method, but they also maintain a vagueness that makes them adaptable to various situations and flexible enough to follow the meanderings and necessities of political action (Bernard, 1999, p. 2). According to Burns et al. (2018), social cohesion refers to how people cooperate within and across group boundaries without coercion or purely self-interested motivation (p. 10). One of the most comprehensive definitions of social cohesion is offered by the OECD, which states that a society is “cohesive” if it strives for the well-being of all its members, combats exclusion and marginalization, fosters a sense of belonging, promotes trust, and offers its members opportunities for upward social mobility (OECD, 2011, p. 51).

Social cohesion refers to connectedness and solidarity within society’s groups. This process establishes the community’s boundaries and shared values (Jenson, 1998). According to Maxwell, social cohesion involves creating shared values and communities of interpretation, reducing wealth and income disparities, and enabling people to feel like they are part of a collective effort, facing shared challenges as members of the same community (Maxwell, 1996, p. 13). The OECD has distilled the common themes in the literature on the definition of social cohesion, highlighting that it is comprehensive, typically linked to social capital, and often focuses on the factors that undermine social cohesion (OECD, 2011).

According to Kawachi and Berkman (2000), social cohesion encompasses two fundamental aspects of society - the absence of underlying social tension and the presence of strong bonds. These bonds can cover various aspects, including income

inequality and racial tensions, and are measured by trust levels and norms of reciprocity (Kawachi & Berkman, 2000, p. 175). Social cohesion plays a crucial role in all spheres of influence, including economic, political, psychological, and social. Thus, it is crucial to understand how researchers approach the issue of social cohesion from different perspectives. Reimer (2002) believes that social cohesion is rooted in four types of relationships: market, bureaucratic, associative, and communal. Understanding these different definitions provides a comprehensive view of social cohesion.

Social cohesion research has faced various challenges, including the need for a clear definition, which affects how it is measured (Dickes & Valentova, 2013; Dickes et al., 2008). There is a need for more agreement on measuring social cohesion (Beauvais & Jenson, 2002). Despite this lack of consensus, social cohesion has been measured using indicators such as trust and belonging. Ballard et al. (2019) argue that this lack of consensus has helped social cohesion research. However, five methodologies have been instrumental in advancing it: politicking, promoting mutual identification and recognition, individual and community psychology, art-based methods, and infrastructure-focused programs. Objective and subjective measures of social cohesion include income inequality, society's cohesiveness, well-being, social capital, and poverty (OECD, 2011). Markus and Kirpitchenko (2007, p. 30) suggest that changes in economics and socio-political factors that accentuate poverty, measured in absolute and relative terms, can undermine social cohesion.

There is a current debate surrounding whether traditional measures of social cohesion need to be expanded. Perception-based measures, such as well-being and life satisfaction, should be included in these assessments. By incorporating these subjective measures, people's feelings about their well-being can be better represented in economic growth and social performance measurements. The Organisation for Economic Co-operation and Development (OECD) has focused on quality of life, life satisfaction, and happiness in its evaluations. The Social Cohesion Radar (SCR) is an international project that has conducted empirical and global comparisons of social cohesion over the past 25 years across 34 European Union countries and seven Western OECD countries. The SCR has been conducted in four

waves, using secondary data from surveys, expert ratings, and international institutes. The findings from the SCR indicate that there are significant differences in social cohesion levels between countries. Scandinavian countries reported the highest levels of social cohesion, followed by Eastern European, Central European, and South-Eastern European countries at the bottom. Vergolini (2011) evaluated social cohesion in the EU-15 and found it has increased. In Asia, Font (2019) examined social cohesion across 22 countries and found that six had a high social cohesion score, 11 had a medium to average rating, and only four had a weak social cohesion score.

A study conducted by Langer et al. (2017) analysed social cohesion in 20 African countries using secondary data from the Afrobarometer survey. The study focused on data collected between 2005 and 2012 and found that Tanzania, Senegal, and Madagascar consistently ranked high on social cohesion, while Nigeria ranked the lowest. The study also revealed that some countries, including Benin, Kenya, Zambia, Lesotho, and Zimbabwe, had improved social cohesion scores. The results above suggest that social cohesion levels are specific to each country's context. However, there still needs to be more understanding about why some countries are more socially cohesive.

Further research is needed to explore context-specific barriers to social cohesion. Although most of the research presented in the studies is from the same continent, social cohesion levels vary widely, indicating that various factors drive social cohesion in some countries more than others. For example, in some countries, the political climate plays a significant role in understanding and achieving social cohesion.

2.6.1 *Dimensions of Social Cohesion*

In discussing social cohesion, it is important to recognise that there are varying dimensions to consider, much like the digital divide. While there are no standardised dimensions for social cohesion, various authors and researchers have proposed different dimensions which have been empirically tested and validated. This section will explore these dimensions, focusing on the three general categories identified in the literature: micro, meso, and macro-level. While there is yet to be a clear consensus

on the complete set of dimensions, it is widely agreed that these three are essential in understanding social cohesion. As such, different countries tend to operationalise these dimensions based on their specific contexts.

Numerous studies have evaluated the facets of social cohesion. Researchers Beauvais and Jenson (2002), as well as Jenson (1998), contend that there are essentially five dimensions or categories of social cohesion in literature: belonging/isolation, insertion/exclusion, participation/passivity, recognition/rejection, and legitimacy/illegitimacy (Beauvais & Jenson, 2002; Jenson, 1998). Later, Bernard (2000) added a sixth dimension of inequality/equality to Jenson's (1998) original proposal. These dimensions have been extensively utilised in various studies. According to the OECD (2011), social cohesion encompasses social inclusion, capital, and mobility. The social inclusion dimension concentrates on matters of social exclusion, such as poverty, inequality, and polarisation. Whereas social capital centres on collective trust measures from both interpersonal and societal perspectives, social mobility assesses how individuals can or perceive themselves to be able to change within society (OECD, 2011).

According to Berger-Schmitt's (2002) research, social cohesion can be viewed through inequality and social capital. The inequality dimension encompasses welfare distribution throughout society, with three sub-dimensions related to regional living disparities, equal opportunities, and social exclusion. The social capital dimension is informed by three sub-dimensions: the quality of institutions, social relations, and social relations and activities. According to Markus and Kirpitchenko (2007), social cohesion is influenced by economic, political, and socio-cultural spheres. The economy is crucial in achieving social cohesion, while political participation and social movements are key enablers of a cohesive society. The socio-cultural sphere encompasses values, beliefs, attainment, sense of belonging, and inclusion in interpreting social cohesion markers. Schiefer and Van der Noll (2017) argue that social cohesion literature shows different intersectional dimensions of social cohesion, with assessment focusing on micro, meso, and macro levels. They suggest three social cohesion dimensions: social relations, identification with the geographic unit, and orientation towards commonly shared well-being. Based on their assessment in

Mexico, Martínez-Martínez et al. (2021) posit that social cohesion should include subjective and objective measures of objective Meso-level indicators, such as norms and values among neighbours, collective efficiency, and bonds with members of the neighbourhood.

Lefko-Everettet et al. (2016) proposed a measure of social cohesion for South Africa, which includes six main dimensions: inclusion, belonging, social relationships, participation, legitimacy, and security. They put these dimensions into practice by measuring belonging, corporation, institution, relationships, identity, trust, and equality, later called the Social Cohesion Index (Burns et al., 2018). Bottoni (2018) conducted a study across 29 countries to assess the measures of social cohesion. Their study used seven dimensions to measure social cohesion as part of their research. They discovered that social cohesion is multidimensional and impacts individuals' behaviour and attitudes.

Meanwhile, Kearns and Forrest (2000) argue that understanding social cohesion is complex and cannot be viewed through a single lens. Based on this, they propose that five dimensions influence social cohesion: "common values and civic culture; social order and social control; social solidarity and deductions in wealth disparities; social networks and social capital; territorial belonging and identity" (Kearns & Forrest, 2000, p. 997). Table 2.2 provides an overview of some of the dimensions of social cohesion discussed in the literature.

Table 2-3 Summary of Social Cohesion Dimensions

Dimensions	**Source**
Belonging/ isolation, insertion/exclusion, participation/passivity, recognition/rejection, and legitimacy/illegitimacy	Jenson (1998)
Inequality and social capital	Berger-Schmitt (2002)
Social inclusion, social capital, and social mobility.	OECD (2011)
Economic, political, and socio-cultural.	Markus and Kirpitchenko (2007)

Social relations, identification with the geographic unit, and orientation towards the commonly shared well.	Schiefer and Van der Noll (2017)
Norms and values among neighbours, collective efficiency, and bonds with neighbourhood members.	Martínez-Martínez et al. (2021)
Social order and social control; social solidarity and deductions in wealth disparities; social networks and social capital; territorial belonging and identity.	Kearns and Forrest (2000)
Inclusion, belonging, social relationships, participation, legitimacy, and security.	Lefko-Everett et al. (2016)
Belonging, corporation, institution, relationships, identity, trust and equality, later referred to as the Social Cohesion Index.	Burns et al. (2018)
Interpersonal trust, the density of social relations, social support, openness, participation, institutional trust and legitimacy of the institution.	Bottoni (2018)

2.7 Socio-economic drivers

There are multiple interpretations of social-economic factors (SEF) in academic literature. Generally, SEF is considered a comprehensive concept that incorporates social and economic status (Dey, 2022, p.206). Demographic, social, and economic factors can distinguish socio-economic status. In this study, socio-economic drivers were measured using certain demographic factors such as age, gender, and population group, as well as social factors like education attainment, geographic/spatial location, and economic factors. Employment status and income were used to gauge economic factors, assuming that employment status is a determining factor for income.

2.7.1 *Socio-economic Drivers of the Digital Divide*

Socio-economic drivers of the digital divide

The study's second research question delves into the intricate factors that contribute to the digital divide, encompassing aspects like income, geography, education, skills, family structure, cost of access, and occupational and marital status. Salajan et al.

(2010) assert that comprehending the digital divide requires a multi-dimensional perspective, which entails institutions, government structures, race and ethnicity, psychological factors, quality of service, network effects, and content as determinants. These socio-economic drivers can be segregated into macro and micro drivers, wherein policy and infrastructure play a pivotal role at the macro level, and individual factors like demographics, economics, and social factors drive the divide at the micro level. This section scrutinizes the socio-economic drivers and endeavours to demonstrate how various micro-level factors fuel the digital divide. The literature on the digital divide accentuates the significance of socio-economic drivers, including age, gender, race, ethnicity, and variables such as income, education, and employment or occupational status. Although other categories like culture are also considered, they have yet to be prioritized in the literature on the digital divide.

Gender and the digital divide

There is varying research on the digital divide and gender differences. Some studies indicate that women are less likely to access and use ITC products, making them digitally underdeveloped compared to men (Kalmus et al., 2013; Mesch et al., 2013). Societal gender dynamics contribute to the diffusion of information and digital technologies. Antonio and Tuffley (2014) identified barriers to accessing digital technologies, including education, free time, financial constraints, and social norms. In Latin America, a study found that women have greater internet usage disparities than men, who are more likely to use social media (Gray et al., 2017). This pattern is consistent with studies conducted in patriarchal and religious societies such as Jordan, where men are less likely to allow women internet access and usage, even among the elite and affluent (Abu-Shanab & Al-Jamal, 2015). However, access to digital and information technologies can also act as a tool for women's liberation, as demonstrated by Shirazi's (2012) study on gender equity and equality in Iran. Van Deursen et al. (2014) found that women were less likely to use the internet than men and that men tended to use it for news and leisure while women used it for games.

According to research by Van Deursen and van Dijk (2018), women prefer using tablets, while their male counterparts favour desktop computers. Meanwhile, Viollaz and Winkler (2021) investigated the correlation between internet usage and female

labour participation outcomes in Jordan. Their results indicate that women actively utilising digital technologies are more likely to have higher labour participation rates, independent of their education or social status. They suggest that access to and use of the internet is a key factor in empowering women professionally.

In certain countries, women's internet adoption and usage are hindered by their family and marital status. According to a study conducted by Al-Saggaf et al. (2017) on Iranian women, unmarried women without dependents are more likely to have internet access and use it regularly than their married counterparts. Furthermore, the study revealed that higher education and income levels increase the likelihood of weekly internet usage for women.

According to a study conducted in India, women are less likely to own a mobile phone and access the internet (Joshi et al., 2020). Similarly, a comparative study in sub-Saharan Africa found that men were more likely to use the internet than women in six countries, including Ghana, Kenya, Nigeria, Senegal, South Africa, and Uganda (Alozie et al., 2017). However, the frequency of internet use between men and women who had access to it was similar in some countries, indicating that bridging the gap between genders is possible once women have access to and use the internet. There were noticeable differences in mobile phone and smartphone ownership in South Africa, with women surpassing men in smartphone ownership while men led smartphone ownership in the other five countries (Joshi et al., 2020).

In contrast, a qualitative study conducted in Kenya delved into women's internet usage and access (Brännström, 2012). The research indicated that a significant obstacle to women embracing and utilising digital technologies was the prevalence of erroneous information about social media. Additionally, the study found that when a mobile phone was replaced with a newer model, men were more likely to inherit the old phone than women, highlighting a key barrier that was also recognised by Wyche and Olson (2018).

Numerous studies have suggested that women's digital empowerment surpasses that of men. However, gender distribution on internet access and usage appears to depend

on context. Several studies have indicated that women are at the forefront of internet usage and the adoption of digital technologies. For instance, in Campos-Castillo's (2015) survey, women were more likely to access the internet than their male counterparts. A similar survey by Haight et al. (2014) revealed that women had more online activities and internet access than men. Despite these findings, significant disparities in technology and internet access persist between men and women globally (Hilbert, 2011; Rowntree, 2018).

Studies have shown gender differences in internet usage between men and women. For instance, Chair (2017) discovered that men tend to gravitate towards sports and betting content, while women typically search for fashion, online shopping, and health-related information. However, a study conducted across 28 EU countries found no significant gender differences in using digital technologies (Elena-Bucea et al., 2020), while a separate study in four Latin American countries found that women in Ecuador, Peru, and Guatemala reported less internet use than men. However, the opposite was true in Mexico (Galperin & Arciacono, 2021). Additionally, another EU study found differences in digital skills between men and women regarding daily internet use and basic digital abilities (Perifanou & Economides, 2020).

According to the Gender Gap Report, there has been a decrease in the enrolment of women in technology skills such as digital literacy, AI, and BIG data, which are considered essential skills for the future (WEF, 2023). This report highlights the connection between gender and the digital divide. The current study examines the impact of gender as a socioeconomic driver on the digital divide at all levels. Additionally, gender plays a crucial role in the digital divide's personal categorical inequalities, as van Dijk (2005) outlined in his Resource Appropriation Theory (RAT), which we will discuss in detail later.

Age and the digital divide

Age is a significant factor in researching the digital divide, with many studies pointing to older adults being less inclined to use digital technologies than younger generations. Research on age disparities in the digital divide has revealed that younger people tend to surpass older individuals regarding online activities and skills. For instance,

DiMaggio et al. (2004) found that younger people are more likely to access the internet than older people, placing seniors at a disadvantage. Furthermore, studies have shown age differences in physical access to technology, with younger individuals having more access than older ones (van Deursen & van Dijk, 2018). Van Deursen et al. (2014) also found that younger people use the internet more frequently than older individuals.

According to research by Haight et al. (2014), younger individuals tend to have a stronger online presence regarding internet access, engagement in online activities, and use of social networking sites compared to older generations. Hargittai et al. (2019) investigated internet skills among older adults aged 60 and above in the United States, revealing a positive correlation between education, income, autonomy use, general internet skills, and social media skills. Even within the older population, there is a divide in internet skills, with those aged 60-64 being more skilled than those aged 75-80 (Hargittai et al., 2019). Van Deursen and van Dijk (2019) found that individuals between 18 and 36 were more likely to use tablets than those between 36 and 65. A study by Wang et al. (2023) conducted in Chinese households further supports the idea that the digital divide is more pronounced among older generations than younger ones. Contrary Fang et al., (2019) found age to be an insignificant determinant of the digital divide. A study conducted in UK to understand how the older adult's older population adopts smartphones, found that they adopt them more for perceived enjoyment Choudrie, et al. (2020). This is contrary to some studies but also highlights that the issue of age and the digital divide may context specific and impacted by other demographic factors such as language, level of education and economic activity. The sampled in group in Choudrie, et al. (2020) did not have any issues with internet access, smartphone and use.

Language and the digital divide

Several studies have investigated the relationship between language and the digital divide, focusing on English language proficiency. This pertains to the ability to access and utilise digital technology. For instance, Livingston's (2010) research explored disparities in internet access and usage between native and foreign-born Spanish speakers residing in the US. The study revealed that individuals born in the US were

more likely to use the internet, which could be attributed partly to their greater familiarity with the English language. This is especially relevant in developing countries where English is not the primary language, as most digital applications and information are only available in English.

According to a study by Dubey and Jyoti (2011), individuals with a strong command of English are more likely to use the internet than those without it. For people residing in rural areas, lack of English proficiency can impact their internet usage patterns. The study highlights how language proficiency and geographical location influence internet access and usage. Similarly, Lissitsa and Chachashvili-Bolotin (2014) examined Israel's internet access and usage patterns, specifically the differences between immigrants and Israeli nationals. The study explored the role of Hebrew proficiency in internet usage and found that stability in the Hebrew language significantly affects internet usage in the country. This finding differs from studies conducted in developing countries, where English proficiency was more significantly related to internet use.

Ethnicity as the Driver of the digital divide

Ethnicity is a socio-economic indicator that sheds light on the individual and household-level digital divide (Martínez-Martínez et al., 2018). Research shows ethnic differences in access to and use of the Internet, with ethnic minority groups being less likely to have access (Chakraborty & Bosman, 2005; Dupagne & Salwen, 2005; Mesch & Talmud, 2011). In a recent study, Yoon et al. (2020) examined the second digital divide in healthcare. They found that White Americans were more likely to seek health information online compared to African Americans, Latinos, and Asians. The pandemic has further highlighted the intersection between economic inequality, the digital divide, and remote learning. A study conducted in the United States found that children in black households had poor and unreliable internet connections compared to white households, creating a divide in access to learning and education tools during COVID-19 (Francis & Weller, 2022).

Geographic Location and the digital divide

Research has shown that people living in urban areas tend to be more receptive to digital technologies than those residing in rural or remote locations. This may be due

to various factors, such as infrastructure limitations and resource constraints in rural areas. Haight et al. (2014) discovered that rural and urban areas with internet access had similar access levels. However, there were significant discrepancies in the usage of social and economic status (SNS). This indicates that although internet penetration may exist in rural areas, it does not necessarily translate into usage, and there may be variations in how and why it is used. As a result, studies should examine access and usage and investigate the reasons and factors behind usage. Steyaert (2002) contends that social stratification continues to perpetuate, with suburban dwellers having access to specific devices that facilitate the adoption and diffusion of technologies compared to those in semi-urban or rural areas. A recent study by Hollman et al. (2021) reveals a disparity in internet connectivity between rural and urban areas. Specifically, rural areas need stable internet connection more than their urban counterparts. This finding aligns with research conducted by Gounopoulos et al. (2018), which revealed that individuals living in central districts require more internet access than those in remote areas.

Many people in remote areas reported not using the internet, which is consistent with Reddick et al.'s (2020) study results. Additionally, Nguyen et al. (2021) discovered that those residing in rural areas reported using the internet less frequently than those living in urban areas. Adeleke (2021) also found a positive correlation between urbanization and internet usage, with individuals in most urban areas more likely to use the internet than their rural counterparts. These findings are further supported by Wang et al.'s (2023) study, which found that most rural households in China lack access to a computer, smartphone, and digital payment compared to urban households. As a result, rural households experience a greater digital divide than their urban counterparts.

Education and the digital divide

Studies on the digital divide often cite education as a key factor. According to research, higher education levels are linked to increased internet usage, with tertiary education having a particularly positive impact (Szeles, 2018). The level of education also plays a crucial role in technology adoption and usage, with those who have completed upper or higher education more likely to use computer technologies than those with only

secondary education (Várallyai et al., 2015). Van Deursen (2014) found that people with lower levels of education tend to use the internet more for social media and games, while higher-educated individuals use it for personal and professional development (Van Deursen et al., 2014).

Research has shown that individuals with lower levels of education tend to use the internet for leisure rather than personal development, in contrast to their more educated counterparts (van Deursen & van Dijk, 2014). As a result, they may miss out on the economic benefits of online activities such as e-commerce (van Deursen & van Dijk, 2014). Furthermore, Deursen and van Dijk (2018) found a strong correlation between using tablets, smartphones, smart televisions, laptops and education level and income. Their findings suggest that individuals with higher educational attainment and wealth are likelier to use laptops. Given these insights, one's level of education can significantly impact their online behaviour. The study also highlighted the three dimensions of the digital divide, which were examined in the context of South Africa's socio-economic drivers (Pazmiño-Sarango et al., 2022), revealing that existing socio-economic inequalities contribute to the digital divide.

Economic Activity and the digital divide

Measuring economic activity is primarily done through income and employment status. Unfortunately, there is a link between the digital divide and lower-income earners. Low-income people often lack access to a computer, internet, and mobile phone (Várallyai et al., 2015), a trend seen in both developed and developing economies. High-income households are more likely to have access to a computer and the internet than low-income households (Montagnier & Wirthmann, 2011; Chakraborty & Bosman, 2005; Kalmus et al., 2013). Research conducted by Cruz-Jesus et al. (2018) found that economic and educational disparities between countries and certain geographic factors are the main drivers of the digital divide. For developing nations such as those in Africa, internet access and other ICT resources remain limited, with access to a computer at home increasing as household income rises. Unfortunately, less than 68% of low-income earners have computer and internet access at home (Várallyai et al., 2015). High to average-income earners are the most frequent internet users and are more likely to benefit from its use (van Deursen & van Dijk, 2014).

Most research on the digital divide has identified income as a key factor driving the divide. Specifically, income disparities between individuals have been found to impact digital inclusion. This is particularly evident among those with lower incomes, as they are more likely to lack access to computers, the internet, and mobile phones (Chakraborty & Bosman, 2005). Such disparities are evident in both developed and developing economies. Indeed, research has shown that higher-income households are more likely to have access to computers and the internet (Chakraborty & Bosman, 2005; Kalmus et al., 2013; Montagnier & Wirthmann, 2011). Cruz-Jesus et al. (2018) analysed digital inequality across 456 countries from the European Union, OECD, Brazil, Russia, India, and China (BRIC) members using a range of datasets. They found that economic and educational disparities between countries are critical drivers of the digital divide in those regions. In developing nations like Africa, access to the internet and other ICT remains a significant challenge. Finally, Hilbert (2016) asserts a strong link between telecom subscription and income, as bandwidth tends to be associated with household income.

The digital divide, an important concept in understanding income and digital differences, is an inherent result of technological development. Hyytinen and Toivanen (2011) conducted a study on the impact of income on mobile phone diffusion in developing countries and found that income positively affects early adoption. Another study by Kudasheva et al. (2015) focused on the role of information and communication technologies in increasing income in Kazakhstan. Their findings showed that households in the wealthiest fifth- and sixth-income categories had a high availability of Internet-based technologies, and that personal computers and Internet access provided an advantage to those who could afford them. Deursen and van Dijk (2018) also discovered a strong correlation between income and using tablets, smartphones, smart televisions, and laptops. Furthermore, economic activity is directly linked to the digital divide, highlighting the role of income in this phenomenon.

In a study conducted by Kharlamova et al. (2018), the impact of technological changes on income inequality in European countries was analysed. The research revealed that technologically advanced countries experience less impact on income inequality due

to technological changes. This indicates that countries with higher technological development tend to have lower income inequality, resulting in a more insignificant effect of technological changes on the country's inequality. The study found that the response to technological changes is more pronounced in countries with deep income inequality. However, it should be noted that technology's impact on inequality can be negative or positive, depending on the country. For instance, inequality and skills bias can result from technology in countries with excellent technological development.

According to Panichsombat (2016), the relationship between internet usage and income was analysed across 191 countries from 1990 to 2015. The findings revealed a weak correlation value of -0.24 between internet use and the Gini coefficient, suggesting that internet penetration narrowed the inequality gap by decreasing the Gini index. However, the interaction terms indicated that increased internet users in the Asia-Pacific region significantly impact income distribution relative to the rest of the world, slightly widening the inequality gap. Similarly, a study by Ono and Zavodny (2007) examined the digital divide in the U.S., Sweden, Japan, South Korea, and Singapore. It revealed that high-income earners are associated with greater Internet access to and use. While a weak correlation was found between digital inequality and pre-existing inequality regarding computer access, significant gaps in IT usage were closely associated with higher societal levels of income, education, and gender inequality. Overall, the study concluded that technological progress has a greater impact on inequality than financial globalization.

Kharlamova et al. (2018) evaluated technological changes that affect income in Europe and found that technological development or country development level affects income. For example, in countries with a high level of development, no correlation was found between technology and income. While less economically and technologically developed countries had higher incomes, they also found that technological changes can be negative and positive. Countries with a high level of income inequality respond to technological changes (Kharlamova et al., 2018). This study showed that the country's economic and technological development level is crucial in deepening income inequalities. Nguyen et al. (2021) state that the country's higher-income households were more likely to use the internet. Their findings suggest that high

income is the potential driver of the digital divide. Income is a widely used measure of economic activity.

Findings from a study across four Latin American countries revealed a noteworthy correlation between employment status and internet adoption. Gender differences were also observed to impact internet adoption significantly among employed individuals. This highlights the interdependence of socio-economic factors, as they exert a mutual influence (Galperin & Arciacono, 2021). Similarly, a study conducted in Nigeria identified income and employment status as key factors influencing internet use (Adeleke, 2021).

Covid-19 and the digital divide

The COVID-19 pandemic has accelerated the adoption of digital technologies, digital transformation, and digitalisation. This acceleration has also brought to light the digital divide issue, further perpetuating the gap. One of the areas in which the digital divide was exacerbated during the pandemic was the education and health sectors. While developed countries with stable and readily available internet connections seamlessly transitioned to virtual consultations, this was not the case in developing countries, where the impact was profound (Ramsetty & Adams, 2020). The pandemic necessitated a shift to online learning, which was a challenge for children without internet access. This disruption to teaching and learning activities was particularly felt in households with limited internet connectivity (Francis & Weller, 2022). These findings align with the results of a study (Azubuike et al., 2021), which revealed that the education and digital divide were significant during the pandemic. Private school attendees were better equipped due to their easier access to ICT devices than their public-school counterparts.

According to Robinson et al. (2020), a lack of access to digital tools and ICT productions, such as the internet and devices, increased the risk of exposure to COVID-19. Li (2022) discovered that individuals with higher levels of internet access during the pandemic had lower death and COVID-19 case rates and higher levels of vaccination. Conversely, those who were digitally excluded experienced higher COVID-19 death rates and lower vaccination levels. These findings suggest that digital

inclusion and access to information played a crucial role in managing the pandemic. Due to limited in-person contact caused by strict lockdowns, people relied heavily on digital technologies for communication during COVID-19. Nguyen et al. (2021) explored how the digital divide affected communication during the pandemic, with access to the internet and infrastructure being significant factors. Lai and Widmar (2021) noted that the rural digital divide was exacerbated during COVID-19, with rural areas experiencing a more significant increase than urban areas.

2.7.2 *Socio-economic Drivers of Social Cohesion*

This section will explore the socio-economic drivers of social cohesion. Thus, the following socio-economic drivers are discussed, gender, age, language, ethnicity, geographic location, education, economic drivers and Covid-19.

Gender and social cohesion

Research suggests that women tend to exhibit higher levels of social cohesion compared to men. In fact, a study conducted by Wickes et al. (2014) in Australia supports this idea, as they found that males tend to have lower social cohesion levels when compared to their female counterparts. Similarly, Paramita et al. (2021) found that females tended to score slightly higher on social cohesion measures than males, although the difference was not significant. However, Sturgis et al. (2014) reported contradictory findings, stating that women reported lower levels of social cohesion than men. Thus, it is apparent that gender differences exist in perceptions and attainment of social cohesion, and it can be inferred that gender plays a role in achieving social cohesion.

Age and social cohesion

Recent studies have shown that there may be differences in social cohesion between older and younger generations. Yi et al. (2016) conducted a study that found seniors aged 65 and above to be more socially cohesive than those aged 18-44 in the US. Similarly, Wickes et al. (2014) discovered that older individuals tend to report higher levels of social cohesion than younger individuals in Australia. However, Sturgis et al. (2014) found that social cohesion decreases with age in the context of London.

Meanwhile, Alhasan et al. (2020) found that individuals between 18 and 30 years old may be living in neighbourhoods with lower social cohesion compared to their 31 to 49-year-old counterparts.

In contrast to previous studies, Paramita et al. (2021) discovered that younger individuals exhibited greater social cohesion than their older counterparts in the Indonesian sample they examined. This highlights the potential influence of age on achieving social cohesion. While we have established that there are indeed differences in social cohesion between younger and older generations, it appears that older individuals may be less socially cohesive than their younger counterparts (Paramita, 2021). Nonetheless, it is critical to explore contextual factors, such as technology, in comprehending social cohesion, particularly among younger individuals. This study delves into age as a socio-economic factor that could determine social cohesion.

Language and Social Cohesion

The use of language has a significant impact on achieving social cohesion, especially in countries with multiple languages spoken. According to Wickes et al. (2014), there are no discernible differences in the relationship between social cohesion and language proficiency among second-language and English speakers. However, Maleku et al. (2019) discovered that English language efficacy was positively associated with increased levels of social cohesion for immigrants living in the United States.

Ethnicity and Social Cohesion

Extensive research has been undertaken to explore the impact of ethnic diversity on social cohesion, as noted by Hudson et al. (2007) and Hudson (2005). Yi et al. (2016) conducted a study, which revealed that non-Hispanic whites and Hispanic adults exhibit higher levels of social cohesion compared to non-Hispanic blacks. Similarly, Bécares et al. (2011) discovered that ethnic disparities have a significant impact on social cohesion in the UK. The study found that areas with a higher ethnic minority population had lower levels of social cohesion. Specifically, the study highlighted that Indian, black Caribbean and white British individuals were affected by ethnic minority

composition (Bécares et al., 2011). However, Ransome et al. (2023) conducted a study in the US, which found no significant relationship between ethnic groups and social cohesion.

Studies have shown that ethnic minorities often score lower on measures of social cohesion than others, and that there is a negative association between ethnic diversity and social cohesion in countries like Germany, the Netherlands, and France (van Staveren et al., 2013; Koopmans & Schaeffer, 2016). Other studies have found that levels of social cohesion have been declining overall, and that Hispanics and blacks report lower levels of social cohesion than their white counterparts in some areas (Millar, 2020; Alhasan et al., 2020). However, some ethnic groups report higher levels of social cohesion than white people born in London (Sturgis et al., 2014). These findings suggest that the relationship between ethnicity and social cohesion is complex and context-dependent. In this study, we will explore the role of ethnicity in social cohesion by examining how different population groups experience and perceive social cohesion in their communities.

Geographic Location and Social Cohesion

According to Cassiers and Kesteloot (2012), spatial segregation plays a crucial role in fostering social cohesion. They also suggest that this segregation can lead to less cohesive societies that are often governed by policies promoting segregation. Meanwhile, Skifter et al. (2016) argue that ethnic segregation within neighbourhoods contributes to social cohesion. Furthermore, research shows that the length of time spent living in a particular area is linked to higher levels of social cohesion (Yi et al., 2016). However, Sturgis et al. (2014) found no significant relationship between ethnic diversity and segregation on social cohesion, suggesting that these factors do not exert a significant influence on social cohesion.

Education and Social Cohesion

Research has shown a strong correlation between higher education and social cohesion. A study conducted by Yi et al. (2016) in the US found that higher education levels were linked to increased levels of social cohesion. Those with higher education levels reported higher levels of social cohesion than those with just a high school

education (Wickes et al., 2014). Additionally, Acket et al. (2011) discovered that social cohesion was strongly associated with lifelong learning in 39 European countries. Thus, education level appears to be a significant factor influencing social cohesion.

Economic Activity and Social Cohesion

Various studies have used income and professional status as a measure to evaluate economic activity and social cohesion (Dekker & Bolt, 2005). While Dekker and Bolt's (2005) study discovered no significant connection between social cohesion and economic activity, Tolsma et al. (2009) found that economic deprivation negatively affects social cohesion. Additionally, Yi et al. (2016) found a link between higher income levels and higher social cohesion levels. According to Wickes et al. (2014), employment status also affects social cohesion, with employed individuals perceiving a higher level of social cohesion than the unemployed. Lower-income individuals reported lower social cohesion levels than those in higher-income brackets (Wickes et al., 2014). Paramita et al. (2021) discovered that higher-income individuals scored lower on the social cohesion score than those with lower incomes. On the other hand, Scheuring's (2020) study on the impact of employment on social cohesion in 13 European countries yielded varying results depending on the country. The research indicates that individual employment status affects their perceptions of social cohesion, with employed individuals having a more positive outlook than the unemployed.

Covid-19 and Social Cohesion

In their study, Borkowska and Laurence (2021) delved into the impact of Covid-19 on social cohesion in England. Their findings revealed a negative effect, as evidenced by a decrease in social cohesion levels compared to previous years (2011-12 and 2014-2015 waves) (Borkowska & Laurence, 2021). Conversely, Stevenson et al. (2021) discovered that Covid-19 fostered social cohesion among neighbours in the UK. It appears that Covid-19 may have both aided and hindered the attainment of social cohesion.

2.8 The South African context

This section highlights some empirical evidence on the digital divide and social cohesion in South Africa.

2.8.1 *Social Cohesion*

"Despite progress since 1994, South African society remains divided. Many schools, suburbs and places of worship are integrated, but many more are not. South Africa remains one of the most unequal economies in the world. The privilege attached to race, class, space and gender has not been fully reversed." (NDP 2012, p. 458).

The above excerpt is taken from the NDP, published in 2012, eighteen years after South Africa transitioned to democracy. As the country approaches the 29th anniversary of this historic event in 2023, it is disheartening to see that our society remains socially, economically, and digitally divided. Social cohesion has become synonymous with the democratic era in South Africa, evident in its inclusion as a pillar of democratic goals. Nation-building and the rainbow nation are terms used to describe social cohesion (Palmary, 2015), highlighting the importance of this issue. Research on social cohesion has been introduced previously. Koehler (2021, p. 638) argues that social protection programs and measures can improve social inclusion and trust, ultimately enhancing nation-building. Bidandi et al. (2021, p. 21) suggest that social cohesion policy aims to bridge the gap in national development, diversity, societal well-being, belonging, trust, employment opportunities, poverty reduction, building inclusive societies, and social-economic rights - all of which point to social-economic inequality in South Africa.

According to Burns et al. (2018), 'Ubuntu' elements are integral to social cohesion in the South African context. 'Ubuntu' is a term that translates to humanity in the Nguni language. The authors suggest that social cohesion has been a crucial component of the rainbow nation-building efforts to address cultural, racial, and individual inequalities that stem from past dispensation (Burns et al., 2018). Meanwhile, Njozela et al. (2017) conducted a study to develop a measure of social cohesion in South

Africa. Their research found that educational attainment significantly influences trust, belonging, and perceived equality (Njozela et al., 2017).

Burns et al. (2018) have built upon the initial research of Lefko-Everett et al. (2016) and Njozela et al. (2017), offering a more comprehensive understanding of social cohesion. According to their findings, social cohesion is "the degree to which people cooperate without coercion, both within and across different groups, and without being solely motivated by self-interest" (Burns et al., 2018, p. 8). The study found a link between the social cohesion index and poverty and unemployment rates (Burns et al., 2018). The definition of social cohesion is not uniform and is often used interchangeably with nation-building and the rainbow nation. Lefko-Everett et al. (2018) conducted a qualitative study using 11 focus group discussions across four provinces - Mpumalanga, Gauteng, Kwa Zulu Natal, and Western Cape - to explore the meaning of social cohesion. Some participants admitted to not knowing what social cohesion meant.

Different interpretations of the term "rainbow nation" have been expressed by those familiar with it. According to a study by David et al. (2018), participants believed the term impacts social cohesion. The study scrutinised the correlation between social cohesion and inequality in South Africa, particularly emphasising interracial interactions as a measure of social cohesion. The findings indicated that individuals who perceived a decline in inequality were more likely to engage in interracial interactions and socialisation than those who did not.

Beliefs about one's living conditions are major in determining social cohesion. Recent research conducted by Meiring et al. (2018) revealed that white individuals are marginally less inclined than black African individuals to view the wealth gap as the most significant division in South Africa. However, Coloured and Indian/Asian minorities are more likely to identify this gap as a significant issue. These studies highlight that achieving social cohesion in South Africa is still a work in progress. Socioeconomic differences such as race, class, income, and digital access also impact social cohesion.

2.8.2 *Digital divide*

“More South Africans use mobile phones (29 million) than listen to the radio (28 million). Despite this, South Africa's ICT sector growth has not brought affordable, universal access to the full range of communications services” ***(NDP 2012, p.190).***

According to Gillwald (2017), South Africa faces a digital divide that reflects the country's societal and economic challenges. Those with access to digital services and the necessary skills are separated from those without access. Additionally, Gillwald notes that the digital divide is evident between those with an internet connection and those without. Research from RIA found that 73% of South Africans with internet access use it for social media, education, work, and job-seeking (Gillwald et al., 2018). This data is consistent with findings from the GHS, which showed that internet usage in urban areas and metros surpasses that of rural areas (Stats SA, 2019). However, a recent ICASA report (2023) indicated a decrease in mobile phone data subscriptions in South Africa by 12.86% from 2018-2022. While Stats SA provides some data on internet access, more empirical data is needed to examine South Africans' skills and use of ICT products.

In a study by Bornman (2016), longitudinal data from the Afro barometer revealed that mobile phone penetration in South Africa exceeded 85%. However, despite this high level of access, no clear association was found between mobile phone access and mobile internet usage. This suggests that while mobile phones may enable internet access for some, other factors are at play. More recently, Lembani et al. (2020) found that students in rural and peri-urban areas with limited access to ICTs had different online learning experiences than those in urban areas with stable internet access. Faloye and Ajayi (2022) also discovered that students from disadvantaged backgrounds at UKZN struggled with computer self-efficacy due to a lack of resources. Interestingly, Pashapa and Rivett (2017) found a stronger correlation between household access to ICTs and male headship, indicating that some female-headed households have lower ICT access than males.

Apart from internet access, usage, and skills, various factors affect internet uptake and penetration in South Africa. These include spectrum availability regulation and the cost of data for internet access. The government has significantly reduced data prices, and network operators have responded positively by reducing mobile data prices since April 2020 (Reporte, 2020). However, despite these efforts, the gap between those with internet access and those without continues to widen. Gillwald et al. (2018) state that gross national income correlates with internet access and mobile phone penetration.

Meanwhile, increasing inflation rates, unemployment, and widespread poverty in South Africa exacerbate this digital divide. The Competition Commission found that data costs were anti-poor in their retail price structures in 2019, citing a lack of spectrum and cost-based facilities access that drives up costs (Commission, 2019). Despite efforts by the Competition Commission to reduce data costs, data remains expensive in South Africa (Chinembiri, 2020). ICASA (2022) reported a 2.2 % decline in the number of people using mobile cellular data in the last seven years, indicating a 46% decrease.

According to Analytics (2020), five pillars drive digital economic opportunities in South Africa: government support, innovative business, human capital, a constructive ecosystem, and universal digital access. The "Universal Digital Access" pillar ensures that all South Africans can access the digital economy and take advantage of its opportunities. This includes examining the state of the country's digital infrastructure, ICT regulation, and device and data affordability across various geographies and demographics (Analytics, 2020, p. 2). While some research has been done on the digital divide issue in South Africa, much of it has been limited to policy briefs and the education sector. The current study seeks to contribute to the body of knowledge on the digital divide by comprehensively examining all three levels and their drivers. Additionally, it explores the relationship between the digital divide and social cohesion.

2.9 Conceptual model of the study

The conceptual model for the study can be found in Figure 2-4 below. The study explored the correlation between social cohesion, the digital divide, and socio-economic factors. Specifically, the study sought to investigate the relationship between social cohesion and the digital divide and the impact of socio-economic factors on both. The model hypothesised a connection between social cohesion and the digital divide, and socio-economic factors shape both. The model depicts social cohesion (Y) as the dependent variable, the digital divide (X) as the independent variable, and socio-economic factors (M) as the mediating variables.

As previously stated, and shown in the figure 2-2 below, the study tested these hypotheses:

- $H_0$1: There is a relationship between the digital divide and social cohesion.
- $H_0$2: There is a relationship between socio-economic factors and social cohesion.
- $H_0$3: There is a relationship between socio-economic factors and the three levels of the digital divide.

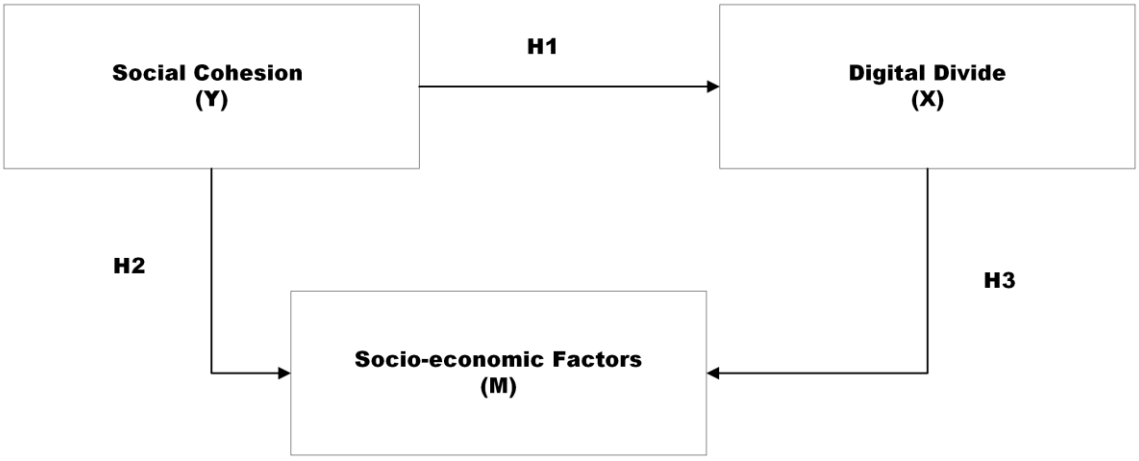

Figure 2-2 Conceptual Framework of the Study

2.10 Conclusion

This section delves into the literature surrounding the definitions of the digital divide and social cohesion, highlighting their complex and multifaceted nature. Despite varying perspectives across authors, it is evident that studies on the digital divide must go beyond the simplistic dichotomy of "haves" and "have-nots." Similarly, the definition of social cohesion is nuanced and context-specific, recognizing the importance of cohesive societies. The literature indicates that research on social cohesion and the digital divide focuses on distinct socio-economic factors as drivers. This study aims to explore the intersection of these two concepts, using the theoretical frameworks of ecological systems theory, theory of social categorization, and resource appropriation theory. The ecological systems theory is the overarching framework, while the resource appropriation theory provides insights into the digital divide's operationalization. The social categorisation theory is used to operationalize the construct of social cohesion. Finally, a conceptual framework is presented, outlining the relationships investigated in subsequent chapters.

CHAPTER 3. RESEARCH METHODOLOGY

In this chapter, the research methodology employed in the study and offer a systematic approach to tackling the "how" of the "what" is discussed. The discussion commences with research paradigm 3.1, which serves as the foundation for the research framework. section 3.2, outlines the mixed-method approach to addressing the following research questions:

> **Research question 1:** What is the relationship between the digital divide and social cohesion?
> **Research question 2:** What socio-economic factors drive the digital divide and social cohesion?
> **Research question 3:** What is the perceived influence/effect of the digital divide in attaining social cohesion?

Section 3.3 presents a concurrent mixed-method design that was used in this study. This design allowed for two data collection phases using different methods. The quantitative phase involved online and paper-based surveys to answer research questions 1 and 2, while the second phase employed qualitative interviews to answer research question 3 and gain a deeper understanding of the study's phenomenon. Section 3.4 discusses the data collection methods, variables, and procedures. Non-probability sampling methods were used in this study due to the unknown size of the population, which is presented in section 3.5. The data collection instruments, consisting of a survey and an in-depth interview guide, are presented in section 3.6. The procedure employed during data collection is described in section 3.7. Section 3.8 discusses the data analysis process and interpretation for both study phases. Section 3.9 addresses the importance of rigour in research to ensure quality assurance. Finally, section 3.10 acknowledges the ethical considerations of research involving human subjects and emphasises the researcher's responsibility to ensure no harm is caused to participants.

3.1 Research paradigm

According to Babbie (2015), a paradigm is a framework that shapes how we observe and understand the world. The word "paradigm" comes from the Greek word "representation." A paradigm is crucial in research as it guides scientific activities and the study's process. It influences how we understand, interpret, and apply knowledge about phenomena, thus shaping the representation of reality in research. Furthermore, a research paradigm plays a crucial role in conceptualization as it aids in gathering, interpreting, and applying knowledge. The paradigm assumptions, which include ontology, epistemology, axiology, and method, shape the researcher's worldview and how they approach their research.

While ontology deals with the scope of research, epistemology is concerned with the scientific principles used to obtain accurate knowledge about the research domain (Creswell & Clark, 2017). Ontology studies the nature of reality, while epistemology focuses on how knowledge is constructed and evaluated (Babbie, 2015; Wagner et al., 2012). Axiology pertains to the researcher's values and how they influence selecting research methods for participants. According to Blanche et al. (2006, p. 58), "Unlike other research paradigms, such as the postpositivist, transformative and constructivist paradigms, the method concerns selection, data collection and analysis." The pragmatic paradigm does not rely on philosophical systems or views of reality but instead utilizes mixed research methods (Creswell & Creswell, 2017).

3.1.1 *Ontological viewpoint*

Ontology, a branch of philosophy, seeks to understand the nature of objects, properties, events, processes, and relations across all domains of reality (Smith, 2012, p.47). The literature distinguishes between two types of ontology: realism and relativism. Realism posits that a singular reality exists, while relativism suggests that multiple realities exist. Within realism, three types can be identified: naive, structural, and critical realism (Moon & Blackman, 2014). On the other hand, relativism can be divided into two types: bounded relativism and relativism. For this research, critical realism is adopted as the ontological viewpoint. Critical realism asserts that while a single reality does exist, it is imperfectly understood due to the limitations of human

intellectual ability and the inherent complexity of phenomena (Guba & Lincoln, 1994, p.110). Sayer (2004, p.9) goes further to argue that "critical realist researchers posit that the world is not only stratified but that some objects are emergent from their constituents". This assertion aligns with the systems theory presented in Chapter Two.

3.1.2 *Epistemological viewpoint*

Epistemology is a field of study that deals with the validity, scope, and methods of gaining knowledge. This includes topics such as what qualifies as a knowledge claim, how knowledge can be obtained, and how its relevance can be determined. In this study, a constructionist epistemology, which is based on two core propositions of constructivism was adopted. The first proposition suggests that knowledge is actively constructed by the individual, rather than passively received from the environment. The second proposition proposes that acquiring knowledge is an adaptive process that helps to organize one's experiential world, rather than discovering an independent, pre-existing reality outside of oneself (Olsen, 1996). Although constructivists reject the notion of having knowledge about the real world, they do acknowledge its existence. This implies that constructivism is an epistemological concept rather than an ontological one (Olsen, 1996). The foundation of constructivism is based on the idea that individuals develop knowledge by interacting with new ideas or situations in conjunction with their pre-existing beliefs or knowledge (Airasian & Walsh, 1997). While constructivists view the real world as incomprehensible, regardless of how well one navigates through the realm of experience, pragmatists believe that truth is determined by what works and is assessed in terms of standard theories of representation or reference, which entail knowledge of the real world (Olsen, 1996).

According to constructivism's most fundamental epistemological principle, the constructed world is experiential and consists solely of experiences. It does not make any claims about 'truth' in terms of correspondence to an ontological reality (Olsen, 1999). Some find it difficult to accept that a knowledge construction model could be designed without making ontological claims about what is known (Von Glaserfeld, 2001). To minimize the epistemological consequences of denying cognitive

representations and advocating a constructivist view, constructivism frequently employs the concept of experience, dissolving the dualism between the mind and the world, inner and outer (Olsen, 1996). The most common objection to constructivism is that it denies reality, but it only denies that one can rationally know a reality beyond our experience. Constructivism does not argue with mystics who express their intuitions about a transcendent world in poetic metaphors that cannot be translated into scientific language (Von Glaserfeld, 2001).

In his work, Raskin (2002) makes a distinction between two types of constructivism: epistemological and hermeneutic. Epistemological constructivism holds that there is an external reality that exists independently of the observer, while hermeneutic constructivism views knowledge as a product of linguistic activity within a community of observers. Constructivism is often used as a metaphor for learning, treating knowledge acquisition as a process of building or construction (Fox, 2001). It is more than just a theory, however; constructivism is often described as a "paradigm" or even a "secular religion" (Fox, 2001). At its core, constructivism posits that humans are active constructors of knowledge, and that learning involves this process of construction (Fox, 2001).

3.1.3 *Pragmatic worldview*

Mixed methods research has been hailed as a response to the long-lasting, circular, and remarkably unproductive debates discussing the advantages and disadvantages of quantitative versus qualitative research due to the paradigm “wars” (Yvonne Feilzer, 2010, p. 6). The research paradigm guides the study’s methodology and data collection process (Wagner et al., 2012). The traditional paradigms used in qualitative and quantitative research are positivist and interpretivist. Mertens (2012, p. 255) argues that “part of the reason for the multiplicity of viewpoints about the role of paradigms in mixed methods research emanates from the different uses of the term paradigm”. There has been a debate regarding the worldviews or research paradigms used in mixed methods among different authors. Others suggest four main paradigms: positivism, interpretivism, pragmatism and transformative (Creswell & Clark, 2017)—the current use employed pragmatism as the worldview informing the study.

Tashakkori et al. (2020) argue for pragmatism and transformation as the dominant mixed-method research paradigms. While Biesta (2010) argues that limitations are often present while the pragmatic view is important in mixed methods. Which he believes could be addressed by using Dewey's pragmatism. He argues that "Dewey's pragmatism can help us to see, for example, that realist assumptions do not necessarily have to go together with an objectivist conception of truth; that intervention plays a crucial role in how we obtain knowledge; and that because our knowledge is always a result of our actions, knowledge can provide us only with information about possible connections between actions and consequences, not with once-and for-all truths about a world independent from our lived lives" (Biesta, 2010,p.2). Qualitative and quantitative approaches use constructivism, interpretivism, and positivism or positivism. Mixed methods research tends to apply different paradigms, as presented above.

The research paradigm informing the proposed study is a pragmatic worldview. It was one of the most flexible approaches and was not committed to a specific philosophy. The pragmatic view is deeply associated with mixed-method research (Creswell & Clark, 2017; Tashakkori et al., 2020). It is often problem-centred, pluralistic, and focused on real-world practices. The pragmatic worldview places more significant emphasis on the consequences of research than on methods used to inform study issues (Creswell & Clark, 2017). The pragmatic rejects the notion that truth' can be determined (Tashakkori & Teddlie, 2009; Bryman, 2016; Ritchie & Lewis, 2013; Subedi, 2016). They do not believe that reality is real and apprehensible or out there but argue an external world independent of our minds.

Pragmatism neither accepts nor rejects the view on subjectivity and objectivity. It embraces both as necessary in the epistemological orientation of the researcher. This means that it does not take any epistemological stance. At the same time, the axiological ground of the pragmatist is value-driven. They emphasise values posed by the researcher in the research process. The researcher's importance, race, and economic background inform the motivation for the proposed study. They influence their epistemic and ontological worldview.

3.2 Research approach

In this study, a mixed methods approach was utilised. There has been a growing global research interest towards incorporating mixed research methods (Bickman et al., 2009; Fielding & Cisneros-Puebla, 2009; Gelo et al., 2008) due to the advantages of using a mixed approach compared to a singular method. A mixed-methods research approach can use quantitative and qualitative strategies to gather numerical data and in-depth text information. This approach is founded on the belief that the most comprehensive understanding of a research problem can be achieved using both data collection methods (Creswell, 2003).

Mixed method research is an approach to an inquiry involving collecting quantitative and qualitative data, integrating the two forms of data, and using distinct designs that may include philosophical assumptions and theoretical frameworks" (Creswell & Creswell, 2018. p 4). Mixed method research is the third methodological movement and a method whose time has come (Biesta, 2010; Creswell, 2009; Creswell & Clark, 2017; Greene, 2008; Johnson & Onwuegbuzie, 2004; Leech & Onwuegbuzie, 2009; Tashakkori & Creswell, 2007a; Tashakkori et al., 2020; Tashakkori & Teddlie, 2008; Terrell, 2012; Yvonne Feilzer, 2010).

The integration of qualitative and quantitative research methods has sparked a discussion among scholars, with various camps emerging, including the "purists," "situationists," and "pragmatists" (Rossman & Wilson, 1985; Onwuegbuzie & Leech, 2003). The purists advocate for employing a mono-method research methodology, meaning that only one method should be used instead of blending qualitative and quantitative methods in research. They argue that a singular methodological approach is adequate for addressing research queries and that employing qualitative and quantitative methods in a single study is superfluous.

The second school of thought are the situationists, who believe the methods should be unadulterated but recognise that each process is acceptable and valuable. They further assert that specific questions are more suitable for qualitative or quantitative research. Thus, they have the same view as the purist in advocating for one method and that the applied methods should not be corrupted or changed. The third school of

thought are the pragmatists, who recognise each method's qualities and strengths as fundamental to understanding phenomena (Rossman & Wilson, 1985; Onwuegbuzie & Leech, 2003). They advocate for mixed methods and argue that each technique's strengths could be leveraged in research. Therefore, using qualitative and quantitative methods counters each method's limitations and builds on their strengths. Also, both can help counter some of the methodological weaknesses of each method. Unlike the purists and situationists, pragmatics are the proponents of the mixed approach and continue to advocate for the value benefit of using the mixed method in research.

In recent years, mixed-methods research has earned a respected place in the academic research community as a valuable tool for conducting research. This is evidenced by the establishment of a dedicated journal, "The Journal of Mixed Methods Research," as well as an increase in literature on its use and benefits (Creswell & Clark, 2017; Onwuegbuzie & Leech, 2004; Tashakkori & Creswell, 2007a; Terrell, 2012). One of the key advantages of mixed methods is its ability to combine both qualitative and quantitative methods, which helps mitigate each approach's limitations. Using both methods, researchers can effectively address the strengths and weaknesses of each. Table 3-1 outlines the respective strengths and weaknesses of qualitative and quantitative methods.

Table 3-1 Qualitative vs Quantitative: Pros & Cons

Qualitative	Quantitative
Findings cannot be generalised.	If randomisation was applied during sampling, the results could be generalised.
Focuses on subjective and lived experience.	More objective, cause and effect relationship.

Focuses on the in-depth and richer exploration of a phenomenon. Provides thick and detailed descriptions of the phenomenon.	Focusing on testing and addressing the relationship between variables of s phenomenon.
Understanding of human experience within the context. Occurs in national settings	This can occur in controlled settings.
The questions are open-ended, allowing the exploration of the phenomenon.	Questions tend to be closed-ended, dichotomous, using the Likert scale.
Uses non-probability sampling methods based on judgement and purposive.	Probability sampling methods allow all the respondents in the sample to have an equal opportunity of being selected. It allows all the respondents to have an equal opportunity of being selected for the study.
It tends to be more inductive, allowing for new theories to be developed.	Deductive by extending or expanding on existing theories

According to Gelo et al. (2008), mixed-methods research can effectively overcome the limitations of qualitative and quantitative analysis. To address the research questions posed in Chapter One, a mixed methodology is necessary for this study. Some experts argue that this method is unique because it aims to prove that the investigation does not rely on just one method. The literature provides various strategies for formulating research questions, with some quantitative questions focusing on causality or exploring relationships between variables (Bryman, 2016; Creswell & Creswell, 2017; Terre Blanche et al., 2006; Wagner et al., 2012). In contrast, qualitative research questions tend to be more exploratory and aim to understand better the phenomenon being studied (Creswell & Clark, 2017).

As previously discussed, mixed-methods research involves the comprehensive gathering, analysis, and integration of quantitative and qualitative data within a single study or longitudinal inquiry program (Creswell & Clark, 2017; Greene, 2008; Terrell, 2012). This type of research aims to provide a more thorough understanding of a research problem or issue than either research approach could achieve on its own. The mixed-methods approach offers a unique way to combine numerical and textual data, with the researcher able to collect and analyse qualitative and quantitative data

based on the study design (Creswell & Clark, 2017). One notable characteristic of mixed methods research is the ability to analyse both data types, complementing each method simultaneously.

3.2.1 *Rationale for mixed-method approach*

A mixed-method approach was employed to answer the research questions and hypothesis presented, combining both qualitative and quantitative data collection methods, specifically a concurrent mixed-method design (Creswell & Clark, 2017; Ivankova et al., 2006). The concurrent mixed-method design allowed for both quantitative and qualitative data collection phases simultaneously. For the quantitative phase, a face-to-face and online survey was created and administered. To ensure inclusivity, a paper-based survey was also administered to those who were digitally excluded and unable to complete the online survey due to a lack of access to digital technologies. This approach ensured that the study was not skewed towards measuring the digital divide among those who can access and use the internet and digital technologies.

In addition to the survey, interviews were conducted to explore participants' perceptions of the digital divide and social cohesion. By employing mixed methods, a comprehensive exploration of the digital divide, social cohesion, and socio-economic drivers was facilitated while maintaining rigour and providing a well-rounded understanding of the topic through positive and interpretive lenses. This approach assumes a pragmatic worldview and broadens the study sample to explore other elements of the first-level digital divide.

This study used a mixed-method approach to collect and analyse data using qualitative and quantitative methods to draw inferences and integrate findings (Tashakkor & Creswell, 2007). This approach enables researchers to improve the precision of our research by combining methods. To gain a comprehensive understanding of the digital divide and social cohesion in South Africa, to mixed approach to data collection from questionnaires and interviews was used. While most

studies explore these constructs using a mono-approach, using mixed-methods will allow for a more in-depth exploration of both constructs.

For the quantitative phase, a survey was used to understand the relationship between social cohesion and the digital divide and the socio-economic drivers of these issues. This method allowed for the exploration and assessment the relationships between variables and reach a wider audience. Utilising both online and paper-based surveys to maximise our reach. In the qualitative phase, the conducted interviews were used to explore the nuances of the digital divide and social cohesion inductively. This allowed to gain insights that the survey could not achieve. Using both qualitative and quantitative data collection methods, allowed for a holistic exploration of the digital divide and social cohesion.

Earlier work on the digital divide was quantitively based on reviewed articles or the use of surveys and secondary data from various databases, such as the World Bank (DiMaggioet al, 2004a; Cruz-Jesus et al., 2018; Mesch et al., 2013; van Dijk, 2017; van Dijk & Hacker, 2003), social cohesion (Beauvais & Jenson, 2002; Jenson, 1998; Langer et al., 2017; Dickes & Valentova, 2013; Laurence, 2011). Limited studies have explored qualitative or mixed-methods in the research on the digital divide (Mumporeze & Prieler, 2017). The same can be said in the literature on social cohesion. Most studies used quantitative surveys or secondary data (OECD, 2011; Norton, 2012; Meyring, 2017; Martínez-Martínez, 2018; Dragolov, 2013; Dickes, 2008). The current study addresses some limitations of using one way but leveraging multiple methods to explore the phenomenon in a South African context. Using mixed methods also aids in triangulating the data collected from both qualitative and quantitative phases.

While there has been a shift towards utilising mixed methods, this approach has limitations. One area for improvement is the researcher's proficiency in conducting both methods effectively (Almalki, 2016). As most researchers only possess expertise in one method, incorporating both can pose a challenge. Additionally, the second limitation pertains to the writing of the findings. The crux of a mixed-method study lies in determining the order in which the findings are presented and how they are

synthesised by the researcher, which can be particularly challenging when employing a convergence design. In addition to the techniques above, the mixed-method approach adeptly incorporates the advantages and disadvantages of the study's quantitative and qualitative methodologies. Consequently, the study's limitations concerning these techniques are intrinsic. As a result, the mixed method was selected to harness both methodologies in addressing the research queries. Table 3-2 shows the research questions and the corresponding methods employed, reinforcing the choice of the mixed method in this study. Furthermore, by leveraging the mixed-method approach, the study provided more comprehensive and in-depth insights into the three constructs of the research: the digital divide and social cohesion.

Table 3-2 Research questions and method employed

Research question	**Methods employed**
What is the relationship between the digital divide and social cohesion?	Survey
What socio-economic factors drive the digital divide and social cohesion?	Survey
What is the perceived influence/effect of the digital divide on social cohesion?	Interviews

3.3 Research design

The literature has varying perspectives and interpretations regarding research design and its limitations. For those new to the field, gaining a comprehensive understanding of research design is crucial before delving into the specifics of a particular study's design. In quantitative studies, the standard designs include surveys, correlation studies, and experimental designs. Qualitative studies typically utilize general qualitative design, phenomenology, grounded theory, ethnography, and action research as commonly accepted methods (Merriam & Tisdell, 2015).

According to Creswell and Creswell (2018), there are three mixed-method designs: convergent, explanatory sequential, and exploratory sequential. Additionally, the literature distinguishes between the mixed explanatory method, the exploratory mixed-

method, and the concurrent mixed method. The explanatory method begins with the quantitative element followed by qualitative data collection, while the exploratory method starts with the qualitative approach followed by quantitative data collection. Finally, the concurrent mixed method uses both methods simultaneously. In the current study, a concurrent mixed method was employed. Creswell and Creswell (2018) state that researchers assume that collecting diverse data types provides a more comprehensive understanding of a research problem than quantitative or qualitative data alone.

Table 3-3 Mixed methods designs.

Mixed method design	Data collection process	Application
Explanatory mixed method	The explanatory mixed method begins with quantitative data collection and analysis in phase one. The results from the first phase are used to develop the research instrument for the qualitative phase.	The explanatory mixed method is applicable in studies with existing quantitative tools that have been previously tested. However, there is a lack of qualitative in-depth which can be explored qualitatively.
Exploratory mixed method	The qualitative phase and data collection take place in phase one. The findings from phase one are used to develop the second phase quantitative instrument.	It begins with the qualitative data collection, and then the quantitative tool development is informed by the findings from the qualitative data.
Concurrent mixed method	As the name suggests, both data collection phases happen in parallel.	Both methods are employed at the same time.

The research employed a concurrent mixed-method design. In a concurrent design, qualitative and quantitative data are gathered and analysed concurrently. An interactive approach may be employed during this period, where data collection and

analysis inform modifications to data collection procedures in an iterative manner (Fetters et al., 2013, p.2137).

The mixed-method design called "concurrent" involves the simultaneous use of two forms of data collection, as illustrated in Figure 3-1 below (Creswell & Clark, 2017). This approach does not have a distinct starting or ending point, as data collection occurs concurrently. The quantitative data was gathered through online and paper-based surveys, while qualitative interviews were utilised to investigate phenomena that could not be effectively explored through quantitative measures. Online in-depth interviews were conducted to gain a deeper understanding of the complexities surrounding the digital divide and social cohesion.

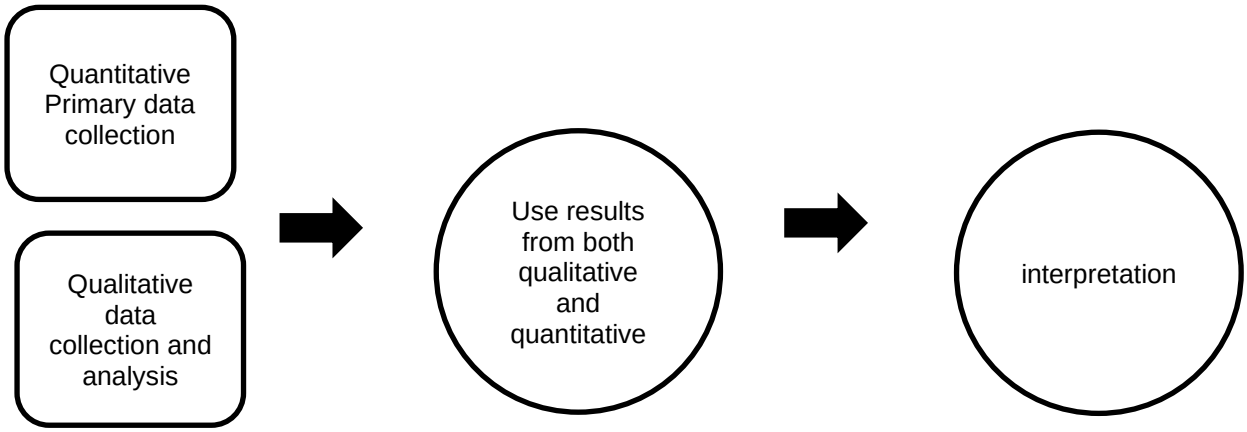

Figure 3-1 Concurrent mixed method design

3.4 Data collection methods

In the study, two phases informed the implementation of the concurrent design. Quantitative data was collected using online and paper-based surveys. The use of the two surveys will be unpacked later when the research instruments are discussed. Online and paper-based surveys were used to collect data in the quantitative phase to unpack the digital divide and social cohesion further. The survey was adapted from a previously used battery of instruments. A survey is one of the most widely used primary data collection tools. Qualitative data were collected using interviews with public members to explore their perceptions of the digital divide and social cohesion.

In the study's first phase, the research employed a combination of online and paper-based surveys. Despite their lower response rates, online surveys have gained popularity in research, as they offer convenience and allow for quick data collection. Digital tools like mobile devices and tablets have further facilitated the preference for online surveys, decreasing the demand for paper-based surveys. In this study, both online and paper-based surveys were employed during the quantitative phase.

In the second phase, qualitative interviews were used to collect data. "Qualitative research provides opportunities to locate the genesis of a phenomenon, explore possible reasons for its occurrence, codify what the experience of the phenomenon meant to those involved, and determine if the experience created a theoretical frame or conceptual understanding associated with the phenomenon" (Williams & Moser, 2019, p.45). Qualitative data collection encompasses a range of methods, including individual and group interviews, document analysis, examination of artefacts, photovoice, and observations. Individual interviews are commonly chosen as a method to gather qualitative data. This study favoured individual interviews over group or focus group interviews. "Interviews are verbal exchanges in which one person, the interviewer, attempts to acquire information from and gain an understanding of another person, the interviewee" (Rowley, 2012, p.260). It is worth noting that focus groups can present ethical challenges, such as concerns regarding anonymity and confidentiality. While both interview methods involve a known relationship between the researcher and interviewee, confidentiality and privacy are generally not problematic in individual interviews. However, in focus group discussions (FGDs), the facilitator/moderator can address the issue of confidentiality but has limited control over what participants share outside the discussion, potentially compromising confidentiality. For this reason, in-depth individual interviews were preferred over the FGD.

3.5 Population and Sampling

3.5.1 *Target population*

According to the latest statistics from South Africa, the country's population is 58.7 million. Most of the population is of black African descent (81.4%), followed by Coloured (8.2%), white (7.3%), and Indian/Asian (2.7%), respectively. There is no significant gender difference, with males (48.5 %) and females (51,5%) (Stats SA, 2022). A large proportion of the population, approximately 34.8%, comprises young people aged between 15 and 35 (Stats SA, 2022). As a result, the survey was limited to individuals above 18.

3.5.2 *Target sample*

The study focused on adults aged 18 and over who participated in the research through digital means or paper-based and in-depth interviews within various communities. O'Dwyer and Bernauer (2013) emphasise the distinction between target and accessible populations, and researchers must understand the differences. The researcher used inclusion and exclusion criteria detailed in Tables 3 and 4 to ensure sample size selection.

Table 3-4 Sample size Inclusion & exclusion criteria

Inclusion criteria	**Excluding criteria**
18 years and above	Individuals under 18 and
Can be able to read and comprehend the questions	those that were classified as mentally incapacitated consented to research

3.5.3 *Quantitative Sampling Method*

The initial phase of the study employed both online and paper surveys, necessitating the use of non-probability sampling methods. Probability sampling and non-probability sampling are the two main types of sampling. Probability sampling involves random selection, ensuring an impartial and unbiased sampling frame where all members of the population have an equal chance of being selected. The population size must be

known to carry out the randomisation process. Random, k-method (also known as the 10th method), stratified, and cluster sampling are the four main types of probability sampling (Wagner et al., 2012). Probability sampling is frequently used in quantitative studies due to its randomisation process and the fact that quantitative studies often aim for large sample sizes.

Non-probability sampling is used when the population size is unknown, and the goal is not to generalise results but to use accessible and available participants. There are four standard non-probability sampling methods: convenience, purposive, quota, and snowballing (Vehovar et al., 2016). Purposive sampling involves using judgment to select participants, which may be difficult to reach and is not based on random selection. Convenience sampling, also known as accidental sampling, uses participants who are easily accessible and available based on their willingness and availability. However, convenience sampling is considered a weaker method with higher bias than other non-probability methods. Snowballing samples rely on a network of interconnected people and referrals. Participants use their network to recommend others with similar characteristics or necessary expertise to respond to research questions. Snowballing is also called chain referral or reputational sampling, where each participant is connected through a network.

Purposive sampling and snowball sampling were used to distribute the survey. The researcher used snowballing sampling by distributing the survey through different sampling methods, such as through social media platforms such as Facebook, WhatsApp and LinkedIn. The survey was also distributed to the Wits student community. Over the years, there has been an increase in the use of social media platforms to distribute online surveys. This was further influenced by the pandemic, which restricted face-to-face data collection. The use of social media for survey distribution is limited. Sample size determination is one of the most contested terrains in quantitative studies. The study employed a non-probability convenience sampling for survey distribution. In addition to purposive sampling, convenience sampling was used to collect paper-based data using surveys. Convenience sampling is used in studies where the population is unknown (Scholt, 2021). The use of convenience sampling has its limitations. Convenience sampling was used because of the

availability of respondents to complete the survey. In addition to convenience sampling, snowball sampling was used. Respondents were given the paper-based survey to share with their family and friends and later collected by the researcher. This was also to keep up with the Covid-19 regulations. The country was under lockdown regulation when the data was collected. Therefore, snowballing ensured minimal contact between the researcher and the respondents. As a result of the pandemic, most staff had to adapt to working from home, and the students started learning online.

In quantitative studies, convenience sampling is discouraged due to its limitations. The two most notable limitations of convenience sampling are the lack of generalisability and selection bias (Farrokhi & Mahmoudi-Hamidabad, 2012; Scholt, 2021; Stratton, 2021). There was no selection bias because a university student population distributed the survey online via social media. In addition, purposive sampling was used to sample individuals who did not have access to the Internet paper-based survey or had limited access. The criteria used:

- Did not have a smartphone or internet.
- Did not have constant access to the internet.

The inclusion criteria assist in addressing biases that involve using non-probability sampling quantitative studies. The use of non-probability online surveys has grown exponentially over the years. They are relatively cheap and can be administered and distributed quickly (Vehovar et al., 2016; Lehdonvirta, 2021; Yeager et al., 2011).

3.5.4 *Qualitative Sample Size and Saturation*

For the qualitative interviews, snowballing and purposive sampling methods were employed. Non-probability sampling methods are particularly well-suited for qualitative studies because they aim to avoid generalising or randomising participants (Wagner et al., 2012). Since qualitative studies are focused on exploring issues in-depth, researchers need to be purposive in their recruitment and selection of participants. However, researchers working in South Africa need to factor the issue of context when thinking of a sampling method. According to Wagner et al. (2012), the historical context of unequal distribution and cultural diversity are two challenges. Additionally, language

proficiency in English can be a hurdle for researchers in this context, given the country's education system and diverse population, which includes 11 official languages and an urban-rural divide.

In practice, sampling methods can often overlap or be used in different stages of a research project (Wagner et al., 2012). According to Tashakkori et al. (2020) Mixed-method studies tend to use purposive, probability, or mixed sampling methods. For this study, a combination of non-probability sampling methods was used. Qualitative studies typically have small sample sizes characterised to explore the study phenomenon in-depth rather than generalising results or findings. The researchers determine the sample size, such as the grounded theory method requiring a sample size of 20-30 participants, while interpretive phenomenological analysis emphasises a sample size of 6-12 participants. Other researchers, such as Creswell (2017), suggest that a sample size of 6 to 18 participants is sufficient for qualitative studies. This study used a mixed method and adopted the general qualitative study with a targeted sample size of 18 participants, per Creswell's recommendation.

In qualitative research, data saturation occurs when no new information is produced, and there is a need for more consensus on this in the literature. The lack of agreement on the acceptable sample size further complicates this issue, leading to varying views and estimates from different authors. To address this, saturation is often used to justify the cessation of data collection once no new information is obtained from interviews. Data saturation has been adopted for this study, with Hennink et al.'s (2017) differentiation between code and meaning saturation informing the target of 20 interviews. This aligns with the literature on the number of interviews required in PhD studies, which suggests that approximately 20-30 interviews can be conducted to achieve data saturation (Mason, 2010).

In qualitative studies, achieving consensus on the number of interviews required is just as crucial as addressing saturation. According to Malterud et al. (2016), a new concept called "information power" is essential to this process. Information power refers to the sample information relevant to the study, and fewer participants are required to achieve it (Malterud et al. 2016, p. 1753). Researchers must consider five fundamental

characteristics when establishing information power: the study's aim, sample size, theoretical underpinning, quality of discussion during the interview, and the analysis strategy employed. Malterud et al. (2016) believe these characteristics can make or break the research. Therefore, researchers must know them when collecting and analysing qualitative data. The study adopted the number proposed by Malterud et al. (2016) in ensuring saturation.

3.6 Analysing The research instruments

3.6.1 *Survey description*

A battery of research instruments was combined and tested to ensure their validity and reliability. The study used the instruments developed by Helsper et al. (2016) and Leininger et al. (2021). Creating effective questionnaires is crucial in studies like this, and thus, the research tool by Helsper et al. (2016) was modified and adapted to suit the South African respondents better. This tool was designed to evaluate the three digital divides (Helsper et al., 2016). Additionally, the study employed Leininger et al. (2021) for social cohesion measures and questions. The questionnaire was divided into sections based on the conceptual framework presented earlier. The survey comprised four sections - A (see Table 3-5).

Table 3-5 Survey description

Section	Description
A	Demographic and socio-economic questions
B	Digital divide questions
C	Social cohesion questions

3.6.2 *The variables of the study*

This study investigated the relationship between socio-economic factors and two key variables: the digital divide and social cohesion. The digital divide pertains to the inequality in access to and utilisation of digital technologies, while social cohesion refers to the extent of connectedness and cooperation within a community. Social cohesion was the dependent variable when analysing the relationship between the digital divide and social cohesion. For the second research question, the digital divide and social cohesion were dependent variables. The study explored various independent variables: age, gender, education, geographic location, and economic activity. Age was classified into different groups, while gender indicated the participants' male or female identification. The education variable represented educational attainment, and geographic location reflected the participants' residential area, whether urban, suburban, or rural. Economic activity encompassed their employment status, occupation, or income level. By investigating the impact of these socio-economic factors on the digital divide and social cohesion, the study aimed to provide valuable insights into the underlying factors that influence these phenomena.

Table 3-6 Dependent and independent variables

Variable name	Definition	Section	Item (s) on the Questionnaire	Sources
Dependent Variables				
Social cohesion	Social cohesion: belonging, trust and subjective wellbeing	C	SC1-SC19	Leininger et al. (2021)
Independent Variables				
Digital divide	Differences between those who have access, use, skills and obtain tangible outcomes by being online. Tangible outcomes of the Internet: economic, cultural, social, and personal	B	DD1-DD30	Helsper et al. (2016)
Socio-economic factors		A	A1-A6	
Age	The age range of the respondents	A	A1	
Gender	The description of the gender of the respondents		A2	
Population group	The racial group that the respondents belong to		A3	
Geographic location	The geographic areas where the respondents reside and live		A4	
Education level	The highest level of education obtained from the respondents		A5	
Employment activity	The economic activity or what they do for a living or make means to live.		A6	

3.6.3 *In-depth- interview guide*

This study utilised an interview guide as a qualitative research tool during the second phase rather than a structured interview schedule. The primary aim was to delve into the levels of the digital divide and social cohesion in South Africa, using in-depth interviews to gain detailed participant insights and perspectives. This approach enabled the researchers to collect rich qualitative data that complemented the quantitative findings and comprehensively examined the topics at hand. The decision to use an interview guide was aimed at to ensuring that the nature, quality, and depth of responses obtained during fieldwork were not compromised, as a structured instrument might limit participants' responses and restrict the exploration of topics. According to Castillo-Montoya (2016), the interview guide can be broken down into four steps.

- Step 1: aligning the interview questions with the research questions.
- Step 2: the development of inquiry-based conversation.
- Step 3: getting feedback on the interview guide.
- Step 4 piloting the interview guide.

The development of the interview guide in this study followed all four necessary steps. As suggested by Chenail (2011), piloting the interview guide proved to be an effective means of identifying any difficult or ambiguous questions, estimating the duration of each interview, and removing any redundant or irrelevant questions. Through piloting, this study conducted a lithium test of the questions and ensured that they were well-understood and comprehended by the participants. As a result, the number of questions was reduced, and an accurate estimate of the interview duration was obtained.

Open-ended questions were used during the interviews to encourage participants to provide more in-depth responses (Babbie, 2015). Tailored prompts were given based on each participant's response to the primary questions. It was essential to ensure that the interview process addressed the participant's communication needs and did not

solely aim to collect information for the study. The interviews were generally 45 to 90 minutes, with breaks accommodated whenever needed. Consistent measures were implemented throughout the fieldwork to maintain quality control and manage data effectively; after conducting the interviews, a data management approach was employed, assigning each participant a pseudonym and numerical label (e.g., participants 1, 2, 3, etc.) as displayed in Figure 3-2 Data Management adapted from Guest et al. (2017)below. These same labels were used to store the audio recordings and transcripts while consent forms were identified using the corresponding pseudonyms.

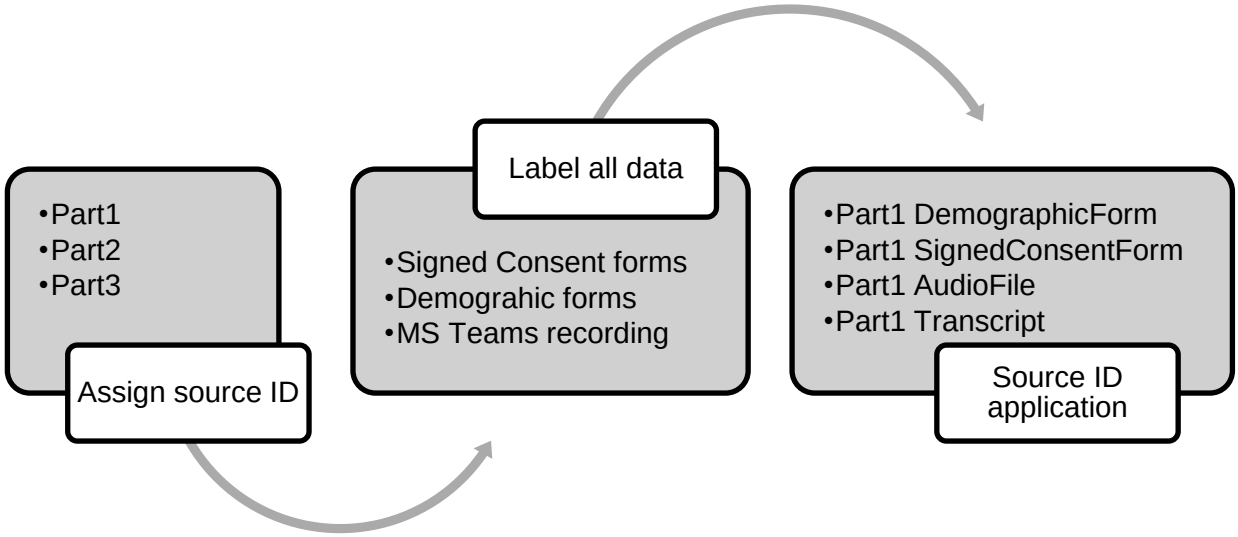

Figure 3-2 Data Management adapted from Guest et al. (2017)

3.7 Procedure for data collection

3.7.1 *Survey*

Surveys serve as a valuable tool for collecting information about a given population. Different types of surveys, including censuses, aim to survey every unit in the population (Fricker, 2008, p. 195). Researchers often use triangulation to ensure accuracy, which involves collecting data or material from multiple sources and perspectives (Flick, 2015; Wagner et al., 2012). In this study, both online and paper-

based surveys were used to reach a diverse range of participants. The online survey was distributed through various digital social media platforms.

In addition, the paper-based surveys were administered to those who were digitally excluded or unable to access the online survey. The researcher and locals approached respondents at shopping malls and taxi ranks to ensure representation from informal and semi-urban communities in Gauteng. Although it was impossible to include all communities in the study, this is a common limitation when surveying populations (Fricker, 2008, pp. 195-196). Overall, this study aimed to gain insights into the digital divide and the benefits associated with being online.

3.7.2 *In-depth interviews*

A series of individual interviews were conducted to collect qualitative data, which is a common practice in qualitative research (Roberts, 2020). According to Chenail (2011, p. 255), interviews are an effective way for researchers to gather insiders' perspectives without imposing limitations through closed-ended questions. The interviews in this study were conducted with members of the public to investigate the digital divide and social cohesion. Discussions were also held with the participants to understand their perceptions better. A comprehensive interview guide was used to collect data, but it was structured in a flexible format, as this could limit the quality and depth of responses. Instead, an in-depth interview guide was developed based on the findings of the quantitative phase and the literature review. This exploratory study aimed to explore the relationship between social cohesion and the digital divide and in-depth interviews were chosen as the research tool to gather diverse views and experiences (Babbie, 2015).

3.8 Data analysis strategies and interpretation

3.8.1 *Quantitative phase data analysis: Descriptive and inferential statistics*

The raw data collected from the Qualtrics microsite, and the paper-based survey was exported into the Statistical Package for Social Sciences version 25 (Field, 2013;

Pallant & Manual, 2007). The SPSS file provided by Qualtrics contained the paper-based survey data. Once all the data was entered, it was screened and cleaned the data to check for errors and ensure accuracy. The preliminary analysis included normality checks, confirmation factor analysis, and reliability and validity assessments.

Non-parametric tests are a suitable option for studies that involve categorical measurements. Field (2016) states that these tests are often called "assumption-free" because they offer more flexibility than parametric tests. Moreover, non-parametric tests are useful when the assumptions for parametric statistics, such as normality, are unmet. Nesselroade (2018) noted that researchers typically consider non-parametric tests as a secondary option. The first option is usually to use parametric tests to analyse data. There are a variety of analyse-sample non-parametric tests available, including the binomial test, the goodness of fit one-sample chi-square test, the Wilcoxon rank-sum test, the Mann-Whitney test, the Kolmogorov-Smirnov one-sample test, and the one-sample runs test (Nesselroade, 2018; Field, 2018; Hair et al., 2018).

On the other hand, Parametric tests are employed when the data meets certain criteria, such as normality. They are also known for their strong statistical power. As Rasch and Guiard (2004) argue, parametric tests offer robustness and enable researchers to conduct meaningful analyses. This methodology enables researchers to evaluate various factors related to the digital divide in South Africa. The process is divided into two stages: the first involves analysing data reliability, including testing internal consistency using Cronbach's alpha coefficient (Field, 2013) and computing descriptive statistics for each variable to ensure accuracy. The second stage involves factor analysis to identify sub-scales within specific questionnaire sections. These sub-scales can compute composite values for higher-level data analysis, such as regression analysis. Before computing these composite scores, some questionnaire responses were reverse coded to ensure consistency in directionality. This approach is supported by Schriesheim and Eisenbach (1995), who argue that reverse scoring can address response bias without affecting data interpretation. In this study, there were no significant differences between items that were positively and negatively scored.

Structural Equation Modelling

A structural equation model was used in the study. Byrne (2013) defines a structural equation model as a statistical methodology that takes a confirmatory approach to analyse a structural theory bearing some phenomenon (p.3). Blunch (2012) posits that SEM Is a conformation statistical method rather than an exploratory one. This is why SEM is used with Confirmatory Factor Analysis (CFA). SEM (Structural Equation Modeling) is usually used to explain multiple statistical relationships simultaneously through visualization and model validation (Dash & Paul, 2021, p. 1). Byrne (2013, p.1) argues that two major aspects of SEM distinguish it from the rest of the statistical methods.

1. The causal process in the study is presented in a series of structural or regression equations.
2. The structural relations are presented in a pictorial format to show the conceptualization of the theory in the study.

According to Hair (2009), SEM models have three main characteristics. Firstly, they allow the conceptualisation of multiple and interconnected dependencies among variables or factors. Secondly, they incorporate unobserved concepts or latent variables in these relationships and address measurement errors during estimation to create a comprehensive model that explains the entire network of relationships within a given context or system. Lastly, Suhr (2006) argues that there are two main goals for conducting an SEM. The first goal is to understand the patterns of correlation or covariance among a specific set of variables, providing insights into their relationships and dependencies. The second goal is to develop a model that effectively explains as much of the variance observed in the variables as possible, capturing and accounting for most of the variability exhibited by the variables under investigation.

Confirmatory Factor Analysis CFA

To explore the relationship between the digital divide and social cohesion, Confirmatory Factor Analysis (CFA) and structural equation modelling were employed, as suggested by Young-Ybarra and Wiersema (1999). According to Gomes et al.

(2017, p. 316), these techniques help researchers investigate the relationships between latent variables and their causal role in explaining the variance of certain observable variables. Graham et al. (2003) also highlights the benefits of CFA, including its ability to fit several rival models to data and force researchers to define constructs precisely (p. 142-143). Furthermore, Gagne and Hancock (2006) and Kyriazos (2018) argue that large sample sizes are often necessary for CFA and SEM. This study's initial response rate before data cleaning was n=1050, which justified using CFA and SEM. As Kyriazos (2018) points out, sample size can influence CFA and SEM parameters' statistical power and precision.

As part of the SEM, CFA was utilised to validate the accuracy of the data by assessing the relationship between observed variables and latent constructs, as explained by Suhr (2006). The present study employed SEM to infer various relationships between social cohesion and the digital divide. According to Kyriazos (2018), the power of attest when using CFA and SEM is determined by four key considerations: the model, the alternative model, significance, and sample size. In testing the first hypothesis using SEM, SC was the endogenous variable, while DD was the exogenous variable. The parameters of the model were estimated through maximum likelihood estimations, and the model's goodness of fit was evaluated through a chi-squared test.

Parameter Estimation

According to Bryne (2013), the primary aim of Structural Equation Modelling (SEM) estimation is to identify parameter values that minimise the difference between the sample covariance matrix (S) and the population covariance matrix indicated by the model. The objective is to obtain parameter estimates that closely match the observed data and conform to the minimisence structure proposed by the SEM model. This is accomplished by reducing the discrepancy function to the point in the estimation process where the difference between the Matrix and the model is the smallest. Ultimately, FMIN determines how S deviates from the model (Bryne, 2013, p. 73).

Model Fit

The model of fit is used to assess how well the model agrees with the observed data (LaValley, 2008). West et al. (2023) argues that two key factors must be considered during the assessment and interpretation of fit indices. The first factor pertains to distinguishing between absolute and comparative indices. Absolute indices are derived from test statistics (T) or residuals, whereas comparative indices evaluate the improvement in fit by comparing the hypothesised model with a baseline model. The second consideration is related to differentiating between goodness-of-fit and badness-of-fit indices. Goodness-of-fit indices generally increase, often reaching a maximum value of 1, as the fit improves. On the other hand, badness-of-fit indices decrease (often to 0) as the fit improves. The values for the degrees of freedom CMIN/DF, the comparative fit index NFI, the root mean
The square error of approximation RFI, IFL, Tucker Lewis Index (TLI), and comparative fit index (CFI) all meet minimum standards.

Regression

Field (2013) explains that regression analysis is a technique for predicting an outcome variable based on one or more predictor variables. This study evaluated the relationship between the digital divide and socio-economic factors using multiple regression. Logistic regression, a mathematical modelling method for analysing the relationship between independent variables and a dichotomous dependent variable (Kleinbaum et al., 2002), was used to examine the first level of the digital divide and its drivers. Since the survey questions used to assess these variables were dichotomous, logistic regression was deemed appropriate for analysing the first and second levels of the digital divide.

3.8.2 *Qualitative data analysis: Thematic analysis*

The qualitative raw data for the study consisted of field notes and transcripts of all interviews. It is essential to begin data analysis early during research and stay close to the study's data, as Terre Blanche and Kelly (1999) have noted. Unlike quantitative research, qualitative research has no precise point when data collection stops, and

analysis begins. Instead, there is a gradual fading out of one and a fading in of the other, as Dawson et al. (1993) have explained. To analyse the data, the researcher used Braun and Clarke's thematic method (2006), subjecting the data to a thematic analysis. The meaning units from the raw data were integrated into themes by grouping them based on similarities and differences and following internal homogeneity and external heterogeneity principles. The thematic analysis enabled the researcher to identify theme cores and nodes from the data, allowing them to move from the particular to the general. To ease the interview analysis and manage the data, the researcher used the qualitative software package NVivo. The software made analysis and data management more manageable with the amount of data involved in qualitative studies.

Various approaches are available for analysing qualitative data, such as interpretive phenomenological analysis, grounded theory analysis, thematic content analysis, and content analysis. Among these methods, thematic analysis is widely used and considered relatively straightforward. Braun and Clarke (2006) suggest that this approach is flexible and permits researchers to examine the data in various ways. By utilising thematic analysis in the study, it was possible to delve deeper into the data and uncover new insights. The six thematic analysis steps proposed by Braun and Clarke (2006, 2012) were integrated into the research, with the researcher following these steps throughout. Table 3-7 Thematic Analysis steps employed in the study are presented below.

Table 3-7 Thematic Analysis steps

Steps	Description of the process	Application in the study
Familiarising with the data	Reviewing and reading the transcript.	A transcription software, Otter, was used; later, the NVivo transcription software was used to assist with the transcription. However, neither captures all the information verbatim. The researcher needed to listen to all the audio and transcribe some omitted sections. This formed part of the data familiarising. Secondly, the transcripts were reviewed and read to ensure that all the captured views were transcribed. During this data collection process, the researcher kept a diary for notes.
Generating initial codes	Systematic coding of the data	Notes were used to assist with the initial codes. The researcher read all the transcripts, used the NVivo software for initial coding, and developed the codebook for further analysis.
Searching for themes	This process involves collating and grouping the initial codes into preliminary themes.	The extracts from the transcripts were identified and included as part of the coding during the data coding. All the codes were then grouped into initial categories for further synthesis.
Reviewing potential themes	This includes a process of deciding which themes are suitable for the study.	Once the initial categories were developed, they were reviewed.

Naming and defining themes	This includes the labelling and definition of the key themes from the study.	The categories were collated, and the themes from the data were named and defined.
Producing the report	Consolidating the themes and writing up the findings.	The final themes were reviewed and incorporated into the final report as part of the write-up. The transcripts' extracts were used to support the themes' naming further.

A hybrid approach, combining inductive and deductive methods, was utilised in the data analysis process. The inductive approach involves analysing data to develop coding, categories and themes, resulting in a deeper understanding of the three constructs and eliciting more nuanced narratives from participants. This rigorous qualitative analysis method offers a more in-depth exploration than the deductive approach. In contrast, the deductive method allows the researcher to anticipate the themes beforehand. This process involves deriving codes, categories, and themes from the research questions or objectives, literature review, and theoretical framework underpinning the study. However, the deductive method can be limiting and prone to bias as it restricts theme development. Codes, categories, and themes are developed from the data rather than emerging from it organically. This approach can also hinder the researcher's ability to uncover new insights from the data. Conversely, the inductive method starts with a clean slate and allows the themes to arise naturally from the data. Despite being a time-consuming process, it is widely considered one of the best methods for qualitative data analysis. Morse and Mitcham (2002) suggest that the inductive approach is more adaptable, although it can be challenging to execute.

Scholars have suggested a hybrid approach combining two methods (Fereday & Muir-Cochrane, 2006; Swain, 2018; Thomas, 2003) and have offered insights on applying this approach effectively. However, one of the challenges of using this method is the potential overlap between the two methods. In our study, we adopted a hybrid approach to aid in coding, specifically for the thematic analysis process. To achieve this, the researcher developed a pre-code book using the terms and theories from the literature review, which was used to guide code development. Additionally, inductive codes were generated as they emerged from the data analysis. Ultimately, a codebook comprising both inductive and deductive codes was utilised.

3.9 Quality Assurance

Describing rigour in mixed methods studies is complex, unlike more traditional quantitative and qualitative approaches. This is because each method has its unique processes and methods for ensuring rigour. Reliability and validity are considered the most essential means of establishing quality in quantitative research. While qualitative studies are only sometimes as straightforward, many methods may be like quantitative approaches. Credibility, dependability, trustworthiness, and member checking are all considered to ensure rigour in qualitative research. Additionally, there is an ongoing debate regarding the most applicable process. These issues are discussed in detail below.

3.9.1 *Quantitative Rigour*

Quantitative studies employ measures of validity and reliability to evaluate the quality and rigour of their findings. According to Sürücü and Maslakci (2020), studies must assess reliability and validity rather than relying on just one method. Both validity and reliability play an integral role in establishing research value. In this study, the validity and reliability of both measures have been considered. Construct validity, categorised into convergent, discriminant, predictive, and divergent reliability, is discussed. As for reliability, an overview briefly touches upon internal consistency using Cronbach's alpha, inter-item correlation, and composite reliability.

Construct Validity

Construct validity involves assessing whether a measure accurately evaluates the construct it intends to measure (Strauss & Smith, 2009, p.2). This means that if the measurements used in a study effectively measure the constructs they are intended to measure, then construct validation has occurred. This process is necessary when a test is interpreted as a measure of an unclear attribute or quality. The question arises for researchers is, "What constructs explain the variation in test performance?" (Cronbach & Meehl, 1955, p.283). In an ideal situation, a measure would assess the magnitude and direction of all characteristics related to the construct it is attempting to measure. This would

mean that any observed variation in the construct's characteristics would only be due to those specific characteristics (Peter, 1981, p.134). Researchers can avoid potential uncertainty in theory testing outcomes by evaluating construct validity and accounting for random errors and method variance. This is important because measurement errors can lead to incorrect acceptance or rejection of hypotheses rather than accurately reflecting the adequacy or inadequacy of the theory (Bagozzi & Phillips, 1991). Researchers can evaluate construct validity using various approaches, including convergent validity, content validity, criterion-related validity, discriminant validity, and reliability (Cronbach, 1955; Peter, 1981; Bagozzi & Phillips, 1991; Ariño, 2003; Strauss & Smith, 2009; Colliver et al., 2012).

According to Heale and Twycross (2015), there are three methods researchers can use to establish construct validity. The first is through homogeneity in how the constructs measure a single construct. The second is through convergence, which occurs when the measurement concepts in the research instruments are similar to those of other instruments. Convergence validity will be discussed in more detail later. The third method is through theory evidence and, finally, criterion validity. Criterion validity is "any other instrument that measures the same variable. Correlations can be conducted to determine the extent to which the different instruments measure the same variable" (Heale & Twycross, 2015, p. 15). Furthermore, Heale and Twycross (2015) notes that criterion validity can be measured through three approaches: convergent, divergent, and predictive.

Convergent Validity

Convergent validity is a crucial concept in research, which involves establishing a strong correlation between scores obtained from multiple methods of measuring the same construct (Gravetter & Forzano, 2018). It determines how well two or more measures can capture a common idea or trait (Carlson & Herdman, 2012, p.18). This type of validity is used to assess the accuracy of multiple measures in capturing the same underlying concept and how well they converge or come together to represent it. Typically, correlation analysis is utilised to measure convergent validity. In this study, the researchers employed

the square root value of average variance extracted (AVE) smaller than CR, Cronbach alpha, and AVE (Sürücü & Maslakci, 2020) to measure convergent validity.

Discriminant validity

The concept of discriminant validity involves determining if a particular underlying variable, like A, is distinct from other variables such as B, C, and D. Essentially, this means that the variable in question should have a stronger influence on related observed variables than any external factors that may be present or other variables within the same framework (Farrell, 2009, p.2). Methods such as paired construct testing, the Fornell and Larcker technique, and multi-trait-multi-method evaluation can be used to assess discriminant validity.

Reliability

The concept of reliability in research is centred around the idea that the test accurately measures what it is intended to measure. According to Blunch (2012), reliability is also tied to the consistency of the measures used in the study (Heale & Twycross, 2015). Various forms of reliability are outlined in the literature, including test-retest reliability, parallel reliability, inter-rater reliability, and internal consistency. Pallant and Manual (2007) emphasise the importance of selecting reliable scales for quantitative studies, as they form the foundation of reliability.

Internal consistency

The study's scales are evaluated for internal consistency using measures such as Cronbach's alpha, split-half reliability, Kuder-Richardson coefficient, and item-to-total correlation. Pallant and Manual (2007) refer to this as the scales' ability to "hang in together." Of these measures, Cronbach's alpha is the most used and is used to assess the internal reliability of the study's constructs (Field, 2013; Pallant & Manual, 2007). Generally, a Cronbach alpha score of .7 or higher indicates reliable scales. Additionally, the total item correlation is used to determine the internal consistency of the constructs and is generally considered reliable if the item correlation coefficient is greater than .5.

Item-total correlation

Item-total correlation pertains to the degree to which the score of each item in the measuring instrument is associated with the total score of all the items in the instrument (Sürücü & Maslakci, 2020). Additionally, the authors recommend that the item-total correlation be utilised. For the study, a respondent sample size of 100-200 is suggested.

Composite reliability

The model relies on a specific parameter to calculate the true and observed composite variances in determining the scale reliability coefficient. An estimate of the reliability of the composite scores can be derived by analysing the ratio between these variances, as per the classical testing theory (Fu et al., 2022).

3.9.2 *Qualitative rigour – trustworthiness*

The issue of rigour or quality in qualitative studies has been a point of contention. One of the key reasons was the need for more clarity about the reliability and validation of qualitative studies. As a result, a scholarly body of literature has focused on the subject, which can debate the rigour of qualitative studies. However, there has been much doubt and pessimistic views on the issues of rigour in qualitative studies. This has not prevented qualitative researchers from establishing ways the findings of the qualitative studies can be seen as academically sound and credible. Literature offers many ways through which this can be achieved in qualitative studies. Namely, transferability, dependability, and credibility will be discussed below (Houghton et al.,2013; Korstjens & Moser, 2018; Polit & Beck, 2010; Slevin & Sines, 1999). "Trustworthiness or rigour in a study pertains to the confidence researchers have in the quality of data, interpretation, and methods employed (Connelly, 2016). A study must be conducted with rigour to ensure reliable and valid results. Several factors contribute to the trustworthiness of research, including the transferability, dependability, audit trail, narrative accounts, participants and expected involvement study design, data collection methods, sample size, data analysis,

peer review, reproducibility, transparency, credibility and member checking. These will be discussed against their application in the study below.

Transferability

Transferability is concerned with the transferability of the research results to another context. It is synonymous with validity in the quantitative study. Transferability refers to the extent to which research findings can be applied to different settings or contexts and differs from other aspects of research in that it requires the active involvement of readers or users (Connelly, 2016; Tong et al., 2007; Tracy, 2010). Researchers can thoroughly describe the research design, methods, and results to achieve transferability. Literature provides guidelines on how transferability can be ensured in qualitative studies. The study ensured transferability through the thick descriptions from the transcript based on the recorded interviews.

Dependability

Dependability is concerned with the stability of the data in the qualitative study. It is similar to the concept of reliability. It highlights the significance of data consistency, stability, and reliability to ensure the quality and trustworthiness of research findings (Tong et al., 2007). By establishing dependability, researchers can demonstrate that their study's results are robust and can be confidently applied or replicated in similar situations. This emphasis on dependability is vital for building a strong foundation for scientific knowledge and advancing research in various fields. The study applied the following measures to ensure the dependability of the audit trail, narrative accounts, participants and expert involvement, and researcher reflexivity. The detailed account of how each was addressed is detailed below.

Audit trail

An audit trail is one of the ways of establishing consistency in qualitative studies. It involves using a detailed audit trail of the research process employed. A detailed account of the selection method and justification of the data collection method and analysis are provided in sections 3.4 and 3.8, respectively. Section

3.5 details the sampling frame and justification used in selecting the participants. In addition, the data collection instrument used has been provided. The analysis model and steps followed during the data analysis are also detailed in section 3.8.2 of the methods employed in the study.

Narrative accounts

The qualitative interviews were collected using Microsoft Teams and recorded and transcribed verbatim; this process enabled the consistency and recording of the qualitative data. The recorded data were transcribed verbatim and allowed for the analyses. The transcripts formed part of the narrative accounts base; thus, the extracts from the transcripts served as the narrative accounts from the participants. Chapter Five presents the findings from the qualitative arm and the extracts.

Participants and expect involvement.

The participants and expected involvement acknowledge that when an individual undertakes research, the methods are used to ensure truthfulness and consistency (Slevin & Sines, 1999, p. 84). The participants were members of the public who were invited to participate in the qualitative arm of the study. The researcher received enormous feedback from people who wanted to be interviewed for the study—the selection, although purposive, was not based on any of the researchers' bias or selection. The prospective participants needed to know social cohesion and the digital divide to engage in a meaningful discussion during the interview.

Credibility

Credibility refers to the authenticity of the research findings. To ensure credibility in qualitative studies, use thick descriptions and concrete details of the experience shared by the participants. It can be employed to ensure credibility, and one is to use the transcripts. In the current study, member checking was used to ensure the credibility of the findings.

Member checking

Credibility was achieved through member checking by sharing copies of the transcripts with the participants to review for accuracy. This exercise also allowed the participants to validate whether the information captured on the transcripts reflects their shared views (Tracy, 2010). The participants were this as an option. This process, also known as member checking, is one of the most used methods in qualitative studies. Secondly, the story's final information, especially the qualitative analysis, will be shared with the participants. This will allow them to review the findings before they are published. Another method widely applied to the credibility of qualitative studies is using audit trails. Audit trails allow experts to review the work to ensure that the qualitative methods have been rigorously applied to the study (Wolf, 2003).

3.10 Ethical considerations

Ethical considerations are fundamental in the research process. Researchers involved in the research process have two basic categories of ethical responsibilities. The first is concerned with implementing the ethical principles espoused in research. Secondly is the protection and safeguarding of the research participants. Research's primary and widely used ethical issues include voluntary participation, no harm to the participant, anonymity, confidentiality, and deception (Creswell, 2017; Blanche, 2006; Flick, 2015; Bryman, 2016). Informed consent by the participants implies that they have been well-informed and understand the research process and implications. Based on the information provided to them by the researcher, they agreed to take part in the study. Anonymity involves the researcher and the participant's inability to find a given response or link it to the participant concerned. Confidentiality consists of how the researcher can find the participants' answers but will not disclose them publicly. Research studies must address all the ethical implications and considerations mentioned.

A critical issue that researchers often neglect is ethical considerations when conducting fieldwork. the ethics clearance was obtained from the University of

Witwatersrand Human Research Ethics Committee (HREC). Informed consent was obtained from the participants before the data collection. For the online survey, the participant information sheet and informed consent were embedded into the survey, allowing only those who consented proceeded with the completion. A similar process was followed for the paper-based survey; the participant information sheet was given to those who completed the surveys and were asked to sign a consent form (Hoelleret al., 2012).

The participants were informed of the study's aim, purpose, and issues relating to informed consent, confidentiality, and anonymity. They were also informed of the right to withdraw from the study without justification. The procedure of what will happen to the collected data will be discussed with participants before the interview. Both verbal and written consent was obtained for the individual interviews. Interviews were conducted virtually using MS Teams. The participants were sent the PIS and consent forms to complete and return to the researcher via email for the virtual interviewees.

3.11 Conclusion

In this chapter, the methodology employed in the study was presented along with a justification and argumentation for the chosen approach and its implementation. A mixed method was employed, incorporating qualitative and quantitative methods to investigate the correlation between social cohesion, socio-economic factors, and the digital divide. Furthermore, the chapter delved into the research design, see table 3-8 for a summary of the methods employed in the study.

Table 3-8 Summary of the methods employed in the study

Phase	**Quantitative**	**Qualitative**
Research questions	What is the relationship between the digital divide and social cohesion? What socio-economic factors drive the digital divide and social cohesion?	What is the perceived influence/effect of the digital divide in attaining social cohesion?

Data collection method	Survey (online and face-to-face)	In-depth interviews
Sampling	Convenience	Purposive and snowballing
Types of data collected	Numerical data	Textual data
Data analysis	SEM, CFA, correlations, ANOVA, logistic and regression analysis	Hybrid thematic analysis, using both inductive and deductive processes for theme development

CHAPTER 4. QUANTITATIVE RESULTS

This chapter aims to present the results from the quantitative phase of the study based on the first two research questions. As illustrated in the first chapter, the following three research questions were used to explore the relationship between the digital divide and social cohesion and socio-economic drivers:

> ***Research question 1:*** What is the relationship between the digital divide and social cohesion?
> ***Research question 2:*** What socio-economic factors drive the digital divide and social cohesion?

Quantitative data was collected using an online survey through Qualtrics and a paper-based survey, and a paper-based survey was administered to respondents in informal and semi-urban areas, including those who may not have internet access. The online survey allowed those with access to smartphones and the internet to complete the survey; those without smartphones and access to the internet would have been excluded from the data collection without paper-based surveys. The same survey was administered for the online and face-to-face data collection; see Appendix C. The survey consisted of three main sections: the demographic or biographic information covered the digital divide questions, while the final section captured social cohesion questions.

Preliminarily, data analysis was performed; the preliminary analysis involved two phases. The first phase involved data screening and cleaning. The raw data were checked for completeness and cleaned for any errors. This was followed by the second phase involving descriptive statistics, reliability and validity assessments, and inferential statistics. Given the nature of the questions, different statistical tests were used to answer the first two research questions. Thus, the following statistical tests were used: SEM for the first research question and regression for the second.

4.1 Data analysis

The data analysis for the quantitative phase of the study involved the following process and steps below. Raw data were exported from the Qualtrics microsite into the Statistical Package for Social Sciences (Pallant & Manual, 2007) version 25 for analysis (Field, 2013; Pallant & Manual, 2007). Data from the paper-based survey was captured in the SPSS file downloaded from Qualtrics. Once all the data was entered into SPSS, two important steps followed: data screening and cleaning. Data screening is a process for checking all the errors in the data that may result in some of the scores being out of range. Once identified, the errors were corrected. The preliminary analysis involved checking for normality, factor analysis and reliability testing.

Given that the nature of the questions asked in the survey was categorical, parametric statistical tests were applied for further inferential analysis. Using SEM, correlations and analysis of variance, logistical regression. The respondents were asked questions focusing primarily on their views and opinions regarding the digital divide and social cohesion. The descriptive statistics present the profile of the respondents who completed the survey. An initial response rate came to n=945 online survey responses, and n=195 were paper-based after data cleaning and screening. Overall, the analysis began with a total of n=1140. The data from the paper-based survey was entered into SPSS. After that, the frequency distribution for all the variables was run to assess if all the data fell within the expected range. This process led to the reduction of the data to include n= 863. The paper-based survey was entered manually, subjecting them to human error. It was, therefore, important to check all the data before commencing the analysis. The data was cleaned and checked for completeness. Frequencies were running on each variable, resulting in incomplete data deletion. Once all the errors were corrected, the study conducted further analysis.

4.2 Biographical results

In Table 4-1 Personal Characteristics results of the respondents are presented. Most respondents fell within the 18-24 age group (46%), followed by the 25-34 (26%) and 33-44 (17%) age groups. The 45-54 (8%) and 55+ (3%) age groups had the smallest representation. The study sample comprised mostly female respondents (58%) and

males (40%). Only 1% identified as nonbinary or third gender, while 1% preferred not to disclose their gender. The study utilised Stats SA's (2022) definitions of population groups, which include four groups. The majority of respondents were African-Black (78%), followed by Whites (11%), Asian/Indian (7%), and Coloured (4%). These results align with the population dynamics of South Africa. The geographic location of respondents was also based on Stats SA specifications, which categorise areas into sub-urban formal, sub-urban informal, and rural. Most respondents were from sub-urban formal areas (71%), followed by sub-urban informal (22%) and rural (7%) areas. In terms of education, the majority of respondents had a matric or high school qualification (46%), followed by postgraduate (27%) and undergraduate (18%) degrees. Only a small percentage of respondents had primary schooling (0.8%), while some had no schooling (2%), and others preferred not to disclose their educational background (6%).

Most respondents in the study consisted of students, accounting for 45% of respondents. Following those employed full-time at 29% and employed part-time at 9%. The remaining percentages comprised the unemployed who were either looking for work (13%) or not (2%), as well as retirees and others who made up 1% each. Please refer to Table 4-1 for further details. In terms of personal income, most respondents reported earning between R1-R2000, with 22.7% of respondents earning R26000 and above and 18% earning between R7500-15000 and above. Additionally, 12.9% indicated they had no personal income, while 8.9% reported earning between R3500-R7500 and 7.6% earned between R2000-R3500. Lastly, 25000 of the respondents earned between R15000 and 25000. Please see Figure 4.1 below for a visual representation of these findings.

Table 4-1 Personal Characteristics

Category		N	%
Age	18-24	392	46
	25-34	226	26
	25-44	148	17
	45-54	67	8
	55±	24	3
	Total	**857**	**100**
Gender	Male	341	40
	Female	499	58
	Non-binary	9	1
	Prefer not to say	10	1
	Total	**859**	**100**
Population group	Black	667	78
	White	93	11
	Coloured	36	4
	Asian/Indian	64	7
	Total	**860**	100
Geographic location	Sub-Urban Formal	609	71
	Sub-Urban Informal	189	22
	Rural	63	7
	Total	**861**	**100**
Education	No schooling	17	2
	Primary schooling	7	1
	High school	391	46
	Undergraduate	157	18
	Postgraduate	236	27
	Prefer not to say	52	6
	Total	**860**	**100**
Economic activity	Employed full time	249	29
	Employed Part-time	76	9
	Unemployed, looking for work	110	13
	Unemployed Not looking for work	19	2
	Retired	10	1
	Student	390	45
	Other	8	1
	Total	**862**	**100**
Source of income	Salary	312	36
	Grant	80	9
	Pension/retirement	11	1
	Remittances	8	1
	Student Bursary	180	21
	Other	270	32
	Total	**861**	**100**

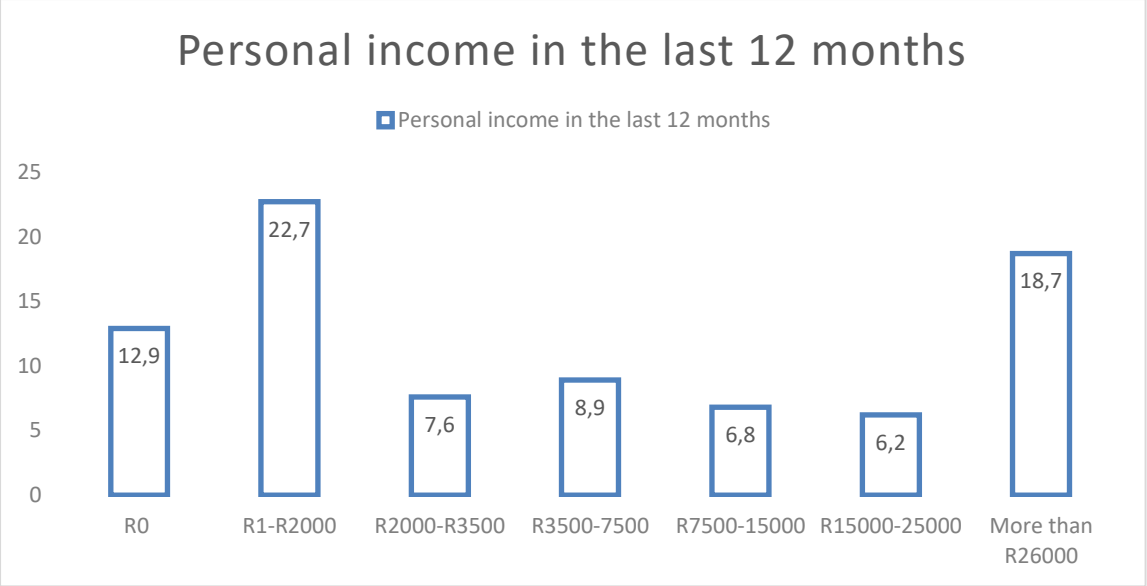

Figure 4-1 Personal source of income

Figures 4-2 below depict the total household income. Like personal income, most respondents indicated a total household income above R26000 and above and less than R3500 at 40.1% and 24.1%, respectively. In the middle, households ranged from R3550-R7500, R15500-R25000, and R7550-R15000, respectively, at 15.5%,11%, and 9%, respectively.

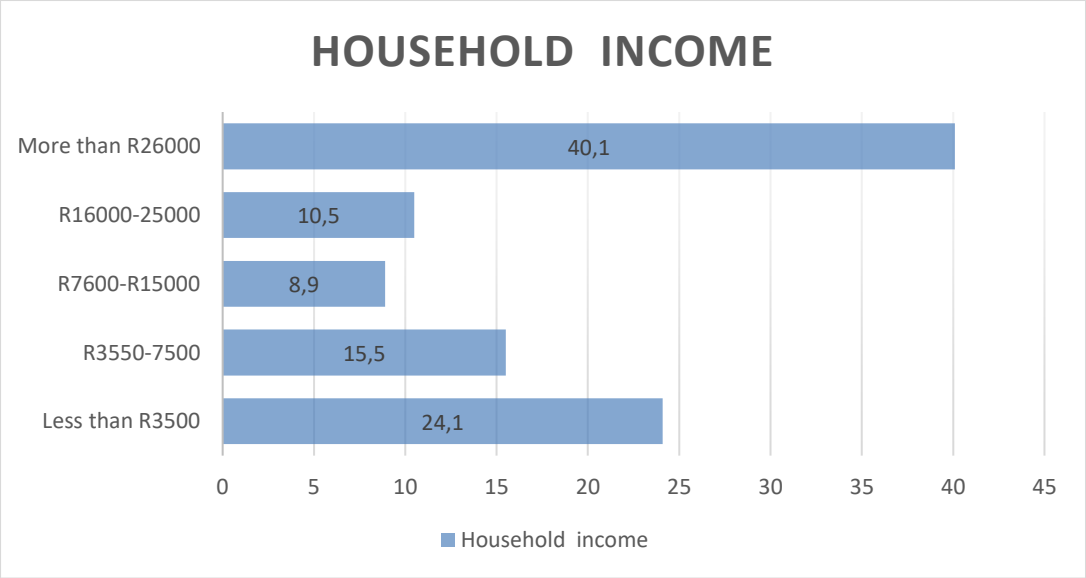

Figure 4-2 Household income

Some respondents indicated that they depended on the grant as a source of income (Figures 4-3 below). Of the grant recipients, the majority stated that they get the

COVID relief grant (8.7%), followed by the child support beneficiaries and older people (1.4%). The disability, care dependency and foster child grants were the least, 0.7% and 0.3%, respectively.

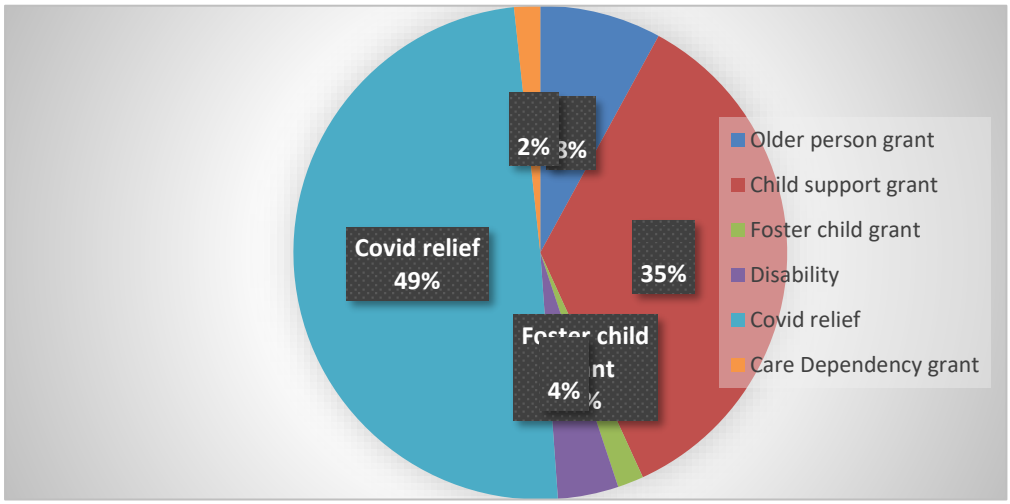

Figure 4-3 Social grant beneficiaries

Figure 4-4 illustrates the distribution of home languages among the respondents. The data reveals that most respondents (24%) reported English as their first language, followed by Isizulu (18.3%), isiXhosa (9.9%), and Sesotho (9.4%). Additionally, "other" accounted for 4.2% of the survey participants.

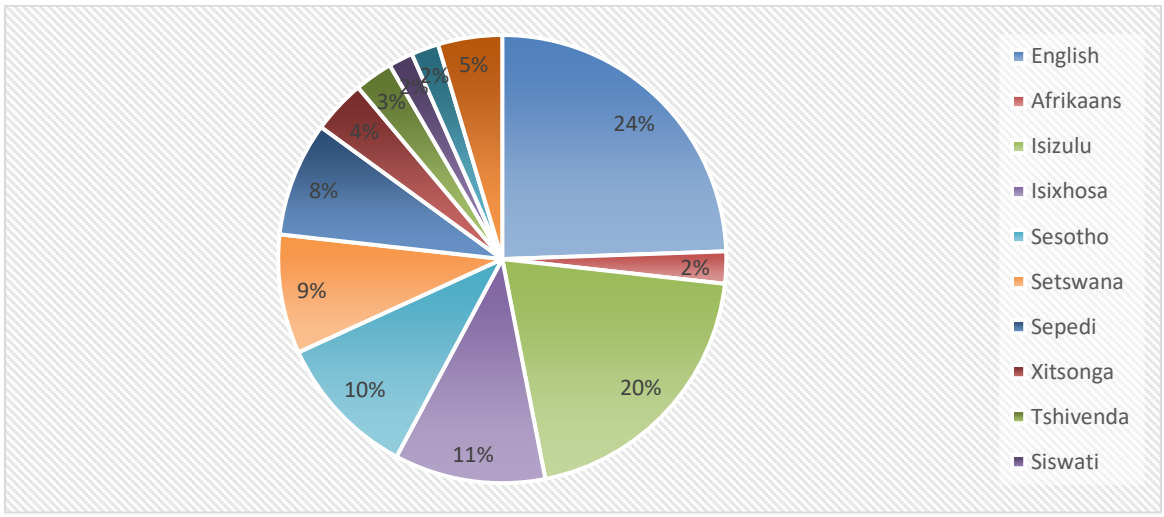

Figure 4-4 Home Language

Most respondents indicated using a mobile phone for internet access (71.9%), followed by those using a laptop or PC and iPad/tablet, 53.2% and 15.5%, respectively, see Figure 4.5 below.

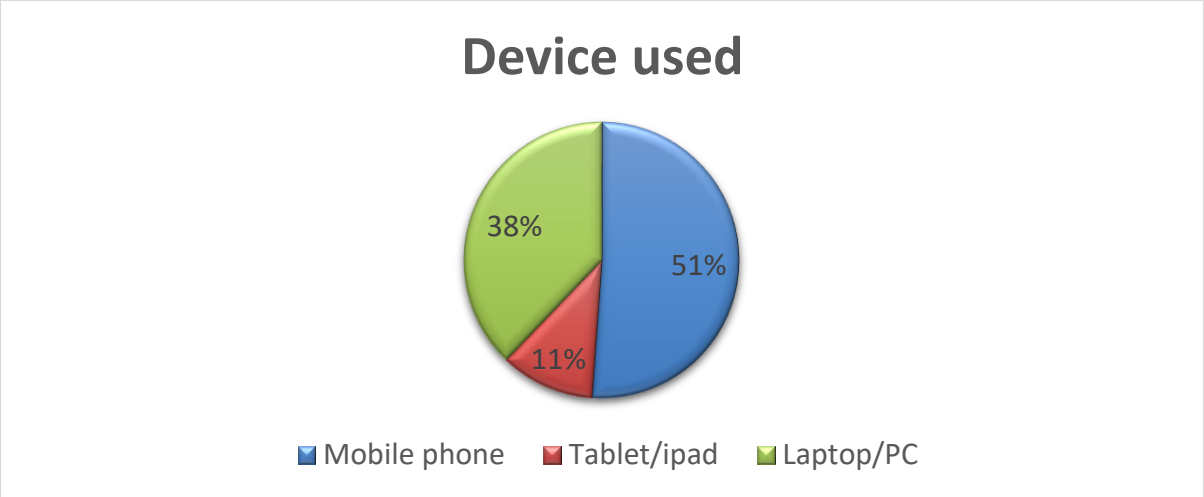

Figure 4-5 Device used

Most respondents were asked to provide details on where they accessed the internet. This was a multiple-response question, and the percentage was calculated using the n=812 who indicated that they have access to the internet. Most have expressed that they access the internet using mobile (82%), followed closely by wireless (64%). Some indicated they use fibre (33%), and only 1% used broadband. When asked where the internet is accessed, the majority stated home (90%), followed by those accessing from work (34%). Others indicated they accessed the internet from restaurants (18%) and community centres or libraries (16%). While 16 % have access from friends and the internet café (10%). Most respondents indicated that they had access to the internet (93.9%) and expressed that they owned a smartphone (94.9%). Only 6.1% and 4.4% indicated they did not have internet access or mobile phone ownership, see Table 4-2.

Table 4-2 internet access mode and place

Category		n	%
Access mode	Mobile	669	82
	Wireless	522	64
	Broadband	51	1
	Fibre	269	33
Place	Home	733	90
	Work	278	34
	Friends	127	16
	Library/community centre	133	16
	Coffee shops/restaurants	147	18
	Internet café	88	10

In addition, the respondents were asked to indicate the amount in rand and time spent on the internet to access patterns. A good portion of respondents spend between R500-1000 and R250-500, respectively, at 16.9% and 16.5% see Table 4-3 below. Only 8.3% indicated they spent R1000 and more, while those spending R50-R100 were 11% and 13.6%, respectively. Most of the respondents spend more than 10 hours on the Internet, 15.8%, followed by those spending 2-3 hours at 14.7%.

Table 4-3 Time and amount online

Category		n	%
Amount spent	R50-R100	137	18
	R100-250	157	20
	R250-500	191	25
	R500-1000	196	25
	R1000 and more	96	12
	Total	**777**	**100**
Time	Less than 1 hour	42	5
	2-3 hours	160	20
	4-10 hours	407	50
	More than 10 hours	173	21
	Not sure	30	4
	Total	**812**	**100**

In addition to the personal characteristics presented above, it was important to look at those respondents who indicated they did not have internet access or mobile phones. Table 4-4 below presents the respondents who indicated not having internet access. Regarding age and gender, no significant differences existed between those with no mobile phone or internet access. Most African respondents indicated no mobile phone (n=43) or internet access (n=47). Most respondents lived in suburban informal areas and were looking for employment.

Table 4-4 Personal characteristics and internet access

Category		**No Mobile Phone**	**No Internet**
Age	18-24	8	7
	25-34	12	11
	25-44	10	15
	45-54	6	7
	55±	9	11
	Total	**45**	**51**
Gender	Male	23	23
	Female	21	28
	Total	**44**	**51**
Population Group	African	43	47
	White	0	0
	Coloured	1	2
	Asian/Indian	1	1
	Total	**45**	**50**
Location	Rural	3	1
	Sub-Urban Formal	3	3
	Sub-Urban Informal	35	41
	Total	**41**	**45**
Education	No Schooling	8	8
	Primary School	4	4
	High School	16	17
	Undergraduate	3	5

	Postgraduate	1	2
	Prefer Not to Say	13	15
	Total	**45**	**51**
Employment	Employed Full Time	2	2
	Employed-Part Time	9	12
	Unemployed Looking	17	23
	Unemployed Not Looking	3	2
	Retired	5	6
	Student	8	5
	Other	1	1
	Total	**45**	**51**

4.3 Reliability and validity measurement

Table 4-5 Reliability and validity testing

Research constructs	Labels	N of Items	Cronbach's Alpha	Item-total correlation	Factor loadings	Composite Reliability (CR)	Average Variance Extracted (AVE)
Digital Divide: Information Search	DD24	8	.929	.873	.937	.932	.639
	DD12			.669	.675		
	DD15			.647	.647		
	DD28			.626	.625		
	DD25			.812	.871		
	DD21			.823	.861		
	DD19			.738	.773		
	DD22			.876	.935		
Digital Divide: Social activities and belonging	DD34	11	.914	.732	.797	.920	.716
	DD33			.682	.759		
	DD44			.719	.748		
	DD36			.688	.744		
	DD29			.696	.730		
	DD38			.697	.724		
	DD39			.705	.723		
	DD43			.669	.715		
	DD37			.689	.702		
	DD35			.562	.594		
	DD26			.567	.640		
Digital Divide: Business/Career Progression	DD18	3	.866	.724	.754	.829	.786
	DD17			.754	.785		
	DD16			.756	.820		
Digital Divide: Leisure/fun	DD13	2	.872	.773	.647	.963	.657
	DD14			.773	.667		
	DD31	2	943	.893	.907	.722	.908

Digital Divide: Religious Activities	DD32			.893	.910		
Social Cohesion	SC14	3	.840	.644	.768	.880	.841
	SC12			.736	.864		
	SC13			.744	.894		

4.3.1 *Cronbach alpha*

The Cronbach alpha is one of the tests used to assess and measure the internal consistency of the instrument question items (see Table 4-5 above). Cronbach alpha, often referred to as the confidence coefficient, has a range of items between 0 and 1, with values closer to one indicating higher internal consistency and those closer to zero showing lower confidence in the items used. A good Cronbach alpha score above four is recommended (Field, 2013; Pallant, 2007). If the Cronbach alpha coefficient is ≥ 0,9, then the scale's internal consistency is high, and if it is 0,7 ≤ α < 0,9, then the scale has an internal consistency. Table 4-5 shows the Cronbach alpha for all items ranging from.840 to.943. The acceptable value for Cronbach alpha is met for all the constructs. Furthermore, it can be observed that the following constructs had a Cronbach alpha ≥ 0,9 Digital Divide: Information Search α =.929, Digital Divide: Social activities α =.914 and belonging Digital Divide: Religious Activities α =.943 suggesting a high internal consistency of the scale. While Digital Divide: Business/Career Progression α = .866, Digital Divide: Leisure/fun α =.872 and social cohesion α =.840, suggesting an internal consistency of the scales. All the constructs have a Cronbach alpha above .4, which is recommended.

4.3.2 *Composite reliability*

The acceptable values for composite reliability are between .60- and .70; those above 70 are acceptable, and those above .95 are undesirable. Table 4-5 shows that the following constructs had the above .95 composite reliability digital divide leisure.96, information search had a composite reliability of .93. Social activities and belonging had a composite reliability of .92. In contrast, the following constructs had an

acceptable composite reliability score: social cohesion .88, digital divide and religious activities .72, digital divide career progression had a value of .82.

4.3.3 *Item- total correlation*

Item total correlation was also used to test the internal consistency and the contribution of the measurement items to the overall score. The sample was more than the recommended sample of q100 (Sürücü & Maslakci, 2020). Heale and Twycross (2015) argue that a correlation coefficient of .3 is weak, while that of .3-.5 demonstrates moderate correlation, and any correlation greater than .5 signifies a strong correlation. While (Sürücü & Maslakci, 2020) argues that the items in the item-total correlations are considered suitable if they range from .30 to .80. In the current study, the total item correlation ranged from .562 to 893, which is acceptable and demonstrates internal consistency of the constructs.

4.3.4 *Convergent validity*

Convergent validity is the assessment to measure the level of correlation of multiple indicators of the same construct that agree (Ab Hamid, 2017, p.2). CFA was used to load the factors of convergent validity. Convergent validity is measured using the square root value of average variance extracted (AVE), smaller than CR, Cronbach alpha and AVE (Sürücü & Maslakci, 2020). The value of convergent validity ranges from 0-1 but should exceed .50 AVE to qualify for convergent validity. Furthermore, the scale is considered reliable if the CR value is more than .7. In Table 4-5, the AVE values ranged from .639. to .908, suggesting that the study construct has met the acceptable criteria for convergent validity.

4.3.5 *Construct validity*

The load estimate's normalised value is significant at 0.50 and above. In the current study, the convergent validity is greater than 0.50 and ranges between .594 and .937 for the results. These results imply that a complete model can be applied to handle the structure. See Table 4-5 above.

4.3.6 *Discriminant validity*

The correlation matrix is associated with testing for discriminant validity. Discriminant validity refers to the extent to which the constructs differ empirically. It also measures the degree of differences between the overlapping constructs (Ab Hamid, 2017, p. 2). Discriminant validity assumes that items should correlate higher among them than they correlate with other items from other constructs that are theoretically supposed not to correlate (Zaiţ & Bertea, 2011, p. 217). The first method of assessing discriminant validity is looking at the factor loadings (Ab Hamid et al., 2017), which argue that factor loadings above .70 are acceptable. In the table above, the factor loadings range from .594- .937, above 70 and acceptable.

Secondly, discriminant validity is observed by looking at the correlation matrix. Tables 4-6 below show the correlations between the constructs of the study. Information search highly correlates with social cohesion (rho =0.343), leisure and fun (.103). However, the highest correlation among all the listed variables is between social activities and belonging and business/career progression (rho = 0.501). The least correlation is between Business/Career Progression and social cohesion (rho = 0.018), followed by Religious Activities and social cohesion (rho=0.019). The second approach to assessing discriminant validity is using the Fornell-Lacker criterion by assessing the e square root of the average variance extracted (AVE) with the correlation of latent constructs. Table 4-6 shows no issues with discriminant validity, suggesting that none of the square roots of AVE is less than any of the correlation.

Table 4-6 Construct correlation matrix

	CR	AVE	Information Search	Social activities & belonging	Business/Career Progression	Social Cohesion	Religious Activities	Leisure & Fun
Information Search	.932	.639	.799					
Social activities & belonging	.920	.716	.117**	.846				
Business/Career Progression	.829	.786	.263**	.501**	.886			
Social Cohesion	.963	.657	.343**	-.107**	0.018	.810		
Religious Activities	.722	.908	.229**	.405**	.313**	0.019	.952	
Leisure and Fun	.880	.841	.421**	.274**	.453**	.103**	.336**	.917

4.4 Normality Assessment

Skewness is a metric used to describe the symmetry of a variable's distribution. A variable's response distribution is skewed if it trends toward the right or left tail of the distribution. Kurtosis measures how peaked the distribution is (Hair et al., 2018). The study aims to ascertain whether the digital divide and social cohesiveness are related. The mean, standard deviation, maximum, and minimum in a univariate analysis characterized each variable. N=857 people were included in the sample, with one representing a significant disagreement and five representing a strong agreement. Each variable's standard deviation represents how widely distributed it is from the mean. If the standard deviation is minimal, the data points are thought to have followed a normal distribution and are near the study's average values. According to the results, the standard deviation is smaller than the mean for each variable in Table 4-7 below. Moreover, it indicates that there is good data distribution.

Tables 4-7 show descriptive digital divide and social cohesion statistics. From the table, the average digital divide scores were 2.9 to 4.51. As part of the descriptive, the information about data normality is assessed using the Skewness value and Kurtosis. Skewness is concerned with the symmetry of the data distribution, while Kurtosis assesses the distribution (Pallant & Manual, 2007). It suggested that for the distribution to be normal, it must have both skewness and kurtosis values of zero. The table below shows that the data were normally distributed, except for "DD35", where the crucial ratio for the skewness value is greater than 1.96. This means the assumption of normality is not violated.

Table 4-7 Descriptive statistics

Variable	Label	N	Min	Max	Mean	SD	Skewness	Kurtosis
I use the internet to look for information on the price of a product (e.g., books, holidays, clothes, cars).	DD12	863	1	5	3.96	1.439	-1.209	-0.042
I use the internet to look for information on how to sell/market my products.	DD13	863	1	5	2.97	1.597	-0.015	-1.569
I use the internet to respond to people's requests for information about my product or service.	DD14	863	1	5	2.9	1.576	0.04	-1.547
I use the internet to search for something (e.g. software, devices, apps, instruments, kits etc.) that would help me do my job better.	DD15	863	1	5	4.08	1.348	-1.384	0.557
I use the internet to search for a job online.	DD16	863	1	5	3.97	1.387	-1.158	-0.041
I use the internet to talk to others about job opportunities (e.g., email, social networking site, or forum).	DD17	863	1	5	3.9	1.406	-1.037	-0.32
I use the internet to create or share my CV on professional and work-related sites (e.g., LinkedIn, Career Junction).	DD18	863	1	5	3.85	1.443	-0.952	-0.545
I use the internet to work remotely.	DD19	863	1	5	3.94	1.536	-1.109	-0.43
I use the internet to look for information about a course or course provider (s).	DD21	863	1	5	4.15	1.392	-1.499	0.714
I use the internet to download course materials.	DD22	863	1	5	4.21	1.446	-1.585	0.792

I use the internet to upload an assignment/ work for evaluation.	DD23	863	1	5	4.21	1.468	-1.551	0.647
I use the internet to study online or attend online courses.	DD24	863	1	5	4.21	1.471	-1.556	0.65
I use the internet to access e-books.	DD25	863	1	5	4.06	1.476	-1.321	0.11
I use the internet to chat about relationships and friendships (e.g., via email, a social networking site, etc.).	DD26	863	1	5	4.08	1.309	-1.311	0.446
I use the internet to look up transport information (e.g., bus or train, flight ticket timetables).	DD28	863	1	5	3.88	1.448	-1.071	-0.318
I use the internet to upload my pictures on social media sites (Twitter, Facebook, Instagram).	DD29	863	1	5	3.88	1.433	-0.993	-0.458
I use the internet to search for websites with religious or spiritual information.	DD31	863	1	5	3.4	1.563	-0.445	-1.351
I use the internet to log in to a website with religious or spiritual content.	DD32	863	1	5	3.23	1.593	-0.264	-1.497
I use the internet to look for updates from friends or family (e.g., email, status/photos on social networking sites).	DD33	863	1	5	4.24	1.162	-1.617	1.664
I use the internet to comment on the updates my friends or family put online (e.g., email, status/photos on social networking sites).	DD34	863	1	5	4.08	1.277	-1.275	0.428
I use the internet to talk to my family or friends who live further away (e.g., via Skype, zoom, Facebook, WhatsApp, or email).	DD35	863	1	5	4.51	0.955	-2.293	4.885

I use the internet to share pictures with my family or friends (e.g., through social networking or photo-sharing).	DD36	863	1	5	4.12	1.268	-1.36	0.638
I use the internet to find websites to help me meet new people (e.g., online dating, social networking sites, hobbies, or crafts clubs).	DD37	863	1	5	3.15	1.641	-0.147	-1.605
I use the internet to make new friends /meet new people.	DD38	863	1	5	3.15	1.578	-0.172	-1.52
I use the internet for blogging or maintaining a website/social media page about my personal life.	DD39	863	1	5	3.05	1.607	-0.05	-1.587
I use the internet to discuss a topic of personal interest with others online (e.g., via email, Twitter, Facebook, or online forum)	DD43	863	1	5	3.75	1.449	-0.807	-0.788
I use the internet to like or promote content that other people post.	DD44	863	1	5	3.65	1.489	-0.714	-0.951
People of other race groups in South Africa are trying to get ahead economically at the expense of my group.	SC12	863	1	5	2.02	1.175	0.988	0.127
People of other race groups in South Africa tend to exclude members of my group from positions of power and responsibility	SC13	863	1	5	1.86	1.095	1.224	0.789
The traditions and values that are important to people of my race are under threat because of the influence of other races in this country.	SC14	863	1	5	2.27	1.28	0.734	-0.499

4.5 The relationship between social cohesion and the digital divide

4.5.1 *Model fit assessment Confirmatory Factor Analysis (CFA)*

SEM was used to validate the accuracy of the data using first-order confirmatory factor analysis (CFA). Amos version 28 was used to conduct the model assessment using CFA. Sun (2005) argues that CFA has three purposes for evaluating construct validity: response pattern and competing model comparison see Figure 4-6.

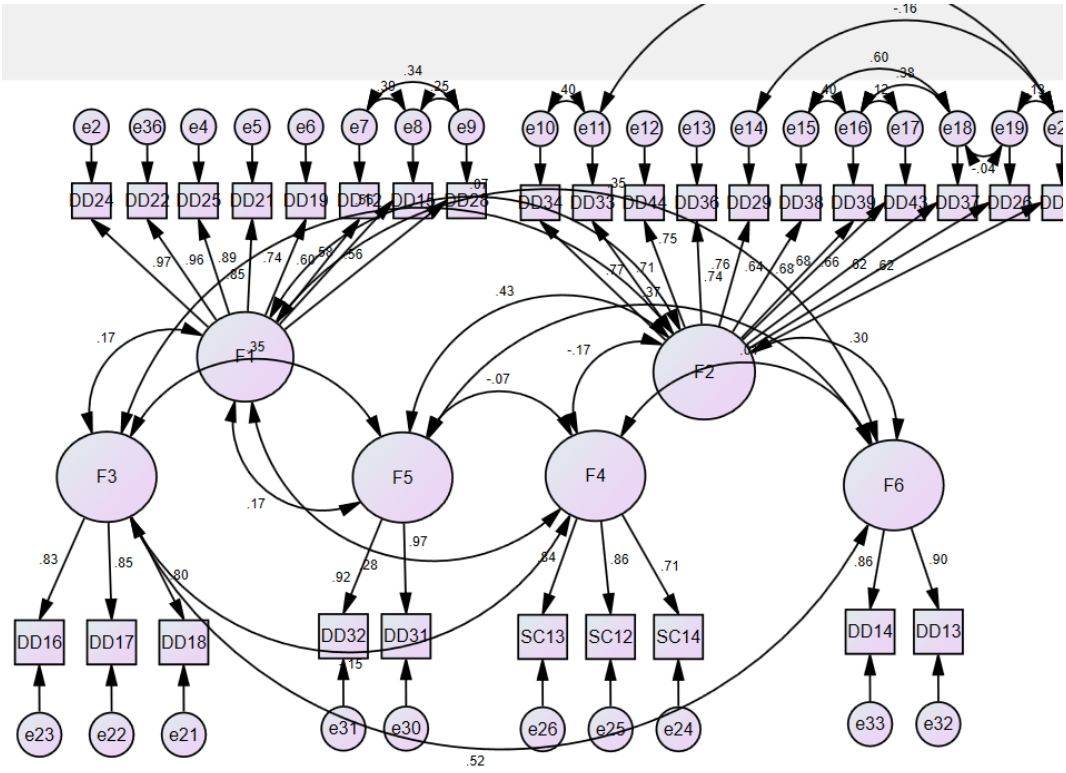

Figure 4-6 Path model CFA

Table 4-8 CFA

Labels	Variables and items	Effect	Factor	Standardized Estimates	S.E.	C.R.	P
DD24	I use the internet to study online or attend online courses	<---	Information Search	0.97			
DD12	I use the internet to look for information on the price of a product (e.g., books, holidays, clothes, cars).	<---	Information Search	0.6	0.03	21.06	***
DD15	I use the internet to search for something (e.g., software, devices, apps, instruments, kits etc.) that would help me do my job better.	<---	Information Search	0.58	0.03	20.39	***
DD28	I use the internet to look up transport information (e.g., bus or train, flight ticket timetables).	<---	Information Search	0.57	0.03	19.44	***
DD25	I use the internet to access e-books.	<---	Information Search	0.89	0.02	48.98	***
DD21	I use the internet to look for information about a course or course provider (s).	<---	Information Search	0.85	0.02	42.21	***
DD19	I use the internet to work remotely.	<---	Information Search	0.74	0.03	30.1	***
DD22	I use the internet to download course materials.	<---	Information Search	0.96	0.01	70.48	***
DD34	I use the internet to comment on the updates my friends or family put online (e.g., email, status/photos on social networking sites).	<---	Social activities and belonging	0.77			

DD33	I use the internet to look for updates from friends or family (e.g., email, status/photos on social networking sites).	<---	Social activities and belonging	0.71	0.03	27.21	***
DD44	I use the internet to like or promote content that other people post.	<---	Social activities and belonging	0.75	0.05	22.77	***
DD36	I use the internet to share pictures with my family or friends (e.g., through social networking or photo-sharing site).	<---	Social activities and belonging	0.74	0.04	22.44	***
DD29	I use the internet to upload my pictures on social media sites (Twitter, Facebook, Instagram)	<---	Social activities and belonging	0.76	0.05	23.03	***
DD38	I use the internet to make new friends /meet new people.	<---	Social activities and belonging	0.64	0.05	19.01	***
DD39	use the internet for blogging or maintaining a website/social media pages about your personal life	<---	Social activities and belonging	0.68	0.06	20.27	***
DD43	I use the internet to discuss a topic of personal interest with others online (e.g., via email, Twitter, Facebook, or online forum)	<---	Social activities and belonging	0.68	0.05	20.1	***
DD37	I use the internet to look for online websites that will help me to meet new people (e.g., online dating, social networking sites, hobby, or crafts clubs)	<---	Social activities and belonging	0.66	0.06	19.43	***
DD26	I use the internet to chat about relationships and friendships (e.g., via email, a social networking site, etc.).	<---	Social activities and belonging	0.62	0.05	18.19	***
DD35	I use the internet to talk to my family or friends who live further away (e.g., via Skype, zoom, Facebook, WhatsApp, or email).	<---	Social activities and belonging	0.62	0.03	18.11	***

DD18	I use the internet to create or share my CV on professional and work-related sites (e.g., LinkedIn, Career Junction).	<---	Business/Career Progression	0.8			
DD17	I use the internet to talk to tutors about job opportunities (e.g., email, social networking site, or forum).	<---	Business/Career Progression	0.85	0.04	26.09	***
DD16	I use the internet to search for a job online.	<---	Business/Career Progression	0.83	0.04	25.48	***
DD31	I use the internet to search for websites with religious or spiritual information.	<---	Religious Activities	0.97			
DD32	I use the internet to log in to a website with religious or spiritual content.	<---	Religious Activities	0.92	0.03	28.85	***
DD13	I use the internet to look for information on how to sell/market my products.	<---	Leisure/fun	0.9			
DD14	I use the internet to respond to people's requests for information about my product or service.	<---	Leisure/fun	0.86	0.04	22.5	***
SC14	The traditions and values that are important to people of my race are under threat because of the influence of other races in this country.	<---	Social Cohesion	0.71			
SC12	People of other race groups in South Africa are trying to get ahead economically at the expense of my group.	<---	Social Cohesion	0.86	0.05	21.8	***
SC13	People of other race groups in South Africa tend to exclude members of my group from positions of power and responsibility.	<---	Social Cohesion	0.84	0.05	21.7	***

4.5.2 *The Goodness of Fit Assessment*

The goodness of fit assesses how well the model agrees with the observed data (LaValley, 2008). The results of the SEM analysis showed that the structural equation model satisfied the incremental requirements with values of RMSEA 0.080, CFI value 0.90 0.90 (model fit), IFI 0.921 0.90 (model fit), and TLI 0.906 0.90 (model fit). It can be concluded from this that the measurements are accurate. The model feasibility test results in Table 4-9 show that almost all the metrics utilised to create this study model are within the goodness-of-fit parameters stated in the cut-of-value column. Consequently, as indicated in the table below, the study model developed satisfies the requirements of the base model. In addition, the output displays the goodness of fit (Chi-Square = 2008.596 and probability of 0.000) and the results. The values for the CMIN/DF, NFI, RFI, IFL, TLI, and CFI all meet minimum standards. Considering the Goodness of Fit Test Results, the model agrees with the data in the table above. According to the table's graphic representation, these tests were conducted to determine the model's suitability.

Several writers have suggested using this ratio to measure fit for the minimum sample discrepancy function CMIN/DF (Field, 2013). The ratio should be close to one for correct models. Before concluding that a model is unsatisfactory, it needs to be clarified how far from one should let the ratio get. Chi-Square is used if the distributional appropriate assumptions are met. If the specified model is correct, the value is the approximate probability of getting a chi-square statistic as significant as that obtained from the current data set. The normal Fit Index is an incremental measure of the goodness of fit for a statistical model, which is not affected by the number of parameters/variables in the model. The relative Fit Index includes a factor representing deviations from a null model. The incremental fit index should always have a poor fit (a very large Chi-square) (Garnier-Villarreal & Jorgensen, 2020). The Tucker-Lewis coefficient is one of the numerous incremental fit indices widely used in linear mean and covariance structure modelling, particularly in exploratory factor analysis.

Table 4-9 Goodness of Fit Index

Goodness of fit	Cut-off value	Results	Evaluation
CMIN/DF (The minimum sample Discrepancy function)	≥2 ≤ 5	4.124	Good Fit
Chi-Square	≥0.05	0.000	No Good[1]
Normal Fit Index (Ellison, Steinfield, & Lampe)	≥0.90	0.90	Good Fit
The relative Fit Index is given by (Saunders et al.)	≥0.90	0.884	Good
Incremental fit index (IFL)	≥0.90	0.922	Good Fit
Tucker-Lewis coefficient (Neal & Neal)	≥0.90	0.910	Good Fit
Comparative Fit Index (CFI)	≥0.90	0.922	Good fit
Root Mean Square Error of Approximation (RMSEA)	≤ 0.05	0.060	Good

4.5.3 *Hypothesis testing*

A structural equation model was used to test the hypothesis of the study. The same fit indices were used for the measurement model. Table 4-10 shows that the structural paths were significant.

Table 4-10 Hypotheses Results

Hypotheses	Endogenous Variable	Effect	Exogenous variables	Estimate	S.E.	C.R.	P
$H_0$1a	Social Cohesion	<---	Information Search	0.31	0.03	7.84	***
$H_0$1b	Social Cohesion	<---	Business/Career Progression	-0.15	0.04	-2.69	0.01
$H_0$1c	Social Cohesion	<---	Religious Activities	-0.04	0.03	-0.94	0.35
$H_0$1d	Social Cohesion	<---	Social activities and belonging	-0.10	0.05	-2.01	0.05

[1] It is worth mentioning that smaller samples tend to frequently pass the normality test compared to larger samples. In the case of larger samples, significant results could be obtained even with a minor departure from normality. However, this slight deviation does not necessarily impact the outcomes of a parametric test.

$H_0$1e	Social Cohesion	<---	Leisure/fun	0.02	0.03	0.42	0.68

This can be further broken into the following hypotheses: information search and social cohesion can be deduced from the estimates for all the main effects; the observation is that the estimated slope for information search is 0.31, which is significant at 10% significance. Accept the null hypothesis; there is enough evidence to reject the alternative. In business/career progression and social cohesion, the estimated slope for business/career progression is significant at -0.15, which signifies a contrasting relationship between the slope for business/career progression and social cohesion. H01c religious activities and social cohesion, the estimated slope is significant at -0.04. Again, a contrasting relationship between the slope for religious activities and social cohesion is observed. The estimated slope for social activities and belonging is significant at -0.10, which signifies a contrasting relationship between social activities and belonging and social cohesion. The estimated slope for leisure/fun and social cohesion is significant at 0.02. it is based on the data presented above.

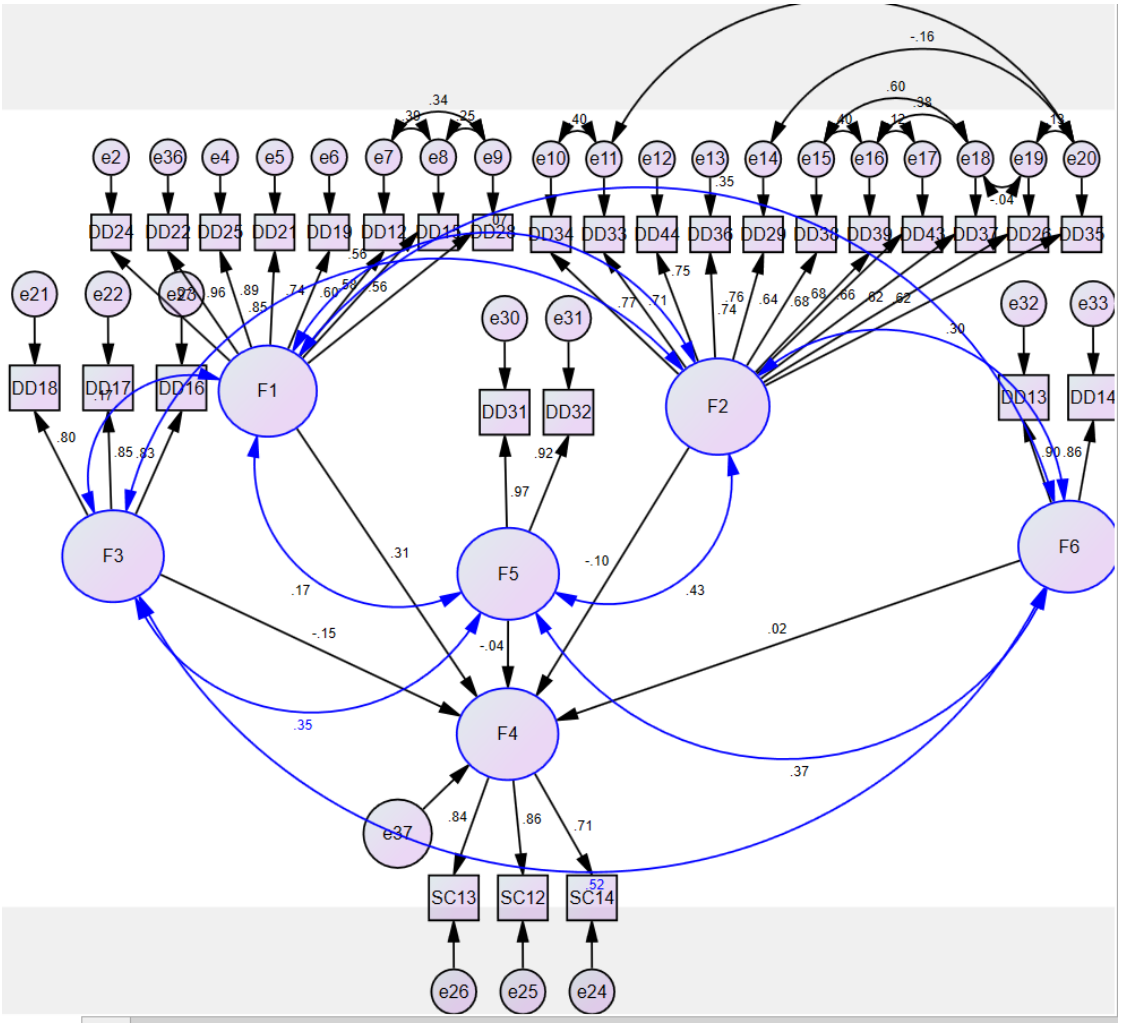

Figure 4-7 Path model regression analysis

4.6 The Relationship between socio-economic factors and social cohesion

The second research question investigated the relationship between social cohesion, the digital divide and socio-economic factors. However, the other two constructs had a good reliability scale, and further analysis was done to understand their relationship with socio-economic variables. Thus, the results between socio-economic variables and social cohesion are presented first, followed by the digital divide and social cohesion results.

4.6.1 *Test for normality*

Kolmogorov-Smirnov and Shapiro-Wilk were used to assess the normality of the distribution of the scores for social cohesion. Kolmogorov-Smirnov statistically assesses the normality of the distribution of scores (Pallant & Manual, 2013, p.63). A significant result is a value of more than .05, which indicates normality. In Table 4-11 below, the sig value is .00, suggesting that the assumptions of normality might have been violated. This is common in most studies with larger sample sizes; the included sample size is n=863.

Table 4-11 Testing Normality

	Kolmogorov-Smirnov[a]			**Shapiro-Wilk**		
	Statistic	**df**	**Sig.**	**Statistic**	**Df**	**Sig.**
Social Cohesion	.154	863	.000	.880	863	.000
a. Lilliefors Significance Correction						

The use of a histogram is also advised in assessing for normality in research studies. After ruling out the null hypothesis for the normality error term, the social cohesion variable underwent a log transformation to eliminate the noise and draw it towards Normality. “Conventional wisdom dictates that the data should be analysed

untransformed, and the residuals examined for outliers, deviations from Normality and other indications of departures from the required assumptions. Transactions may be considered if this investigation indicates severe problems (Keene, 1995, p.811). The histogram appears to have three distributions; the distribution demonstrates that the population is split into three clusters. This suggests that before the analysis of each cluster, there was a need to identify and analyse each. The social cohesion variable was unchanged because none of the attempted modifications was successful, see Figure 4-8.

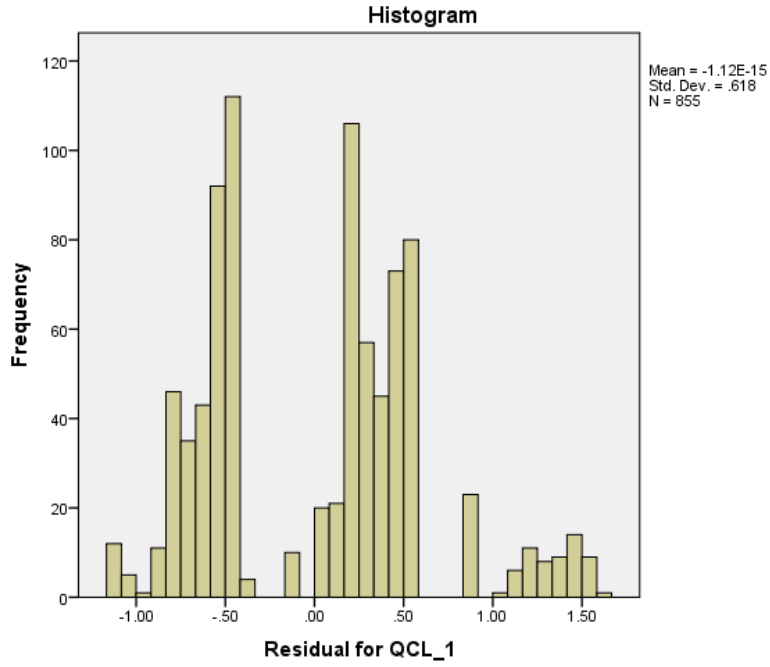

Figure 4-8 Histogram

Table 4-12 Number of cases per cluster

Cluster	1	373
	2	407
	3	83
Valid		863
Missing		.000

Table 4-12 depicts the number of cases per cluster. The first cluster has 373 respondents, the second cluster has 407 respondents, and the third cluster has 83 respondents, with 863 valid cases and none missing.

Table 4-13 Mean Difference

Cluster number	Age	Economic Activity	Education Level	Geographic Location	Population Group	Gender
1	1.83	4.69	3.72	1.85	1.47	1.64
2	2.15	4.56	3.62	2.40	1.26	1.61
3	1.67	4.69	3.82	1.63	1.92	1.76

Table 4-13 shows the mean differences between the three cluster cases by age, economic activity, education level, geographic location, population group and gender. Economic activity had the highest mean ranging from 4.56-4.69, followed closely by education with 3.62-3.82. The mean for the geographic location was between 1.63 and 2.40, and the age for cluster 1 was between 1.67 and 2.15. At the same time, that of gender was between 1.61 and 1.76.

Table 4-14 ANOVA

ANOVA Table			Sum of Squares	Df	Mean Square	F	Sig.
Age	Between Groups	(Combined)	27.385	2	13.693	11.120	.000
	Within Groups		1051.565	854	1.231		
	Total		1078.950	856			
Economic Activity	Between Groups	(Combined)	3.682	2	1.841	1.138	.321
	Within Groups		1391.979	860	1.619		
	Total		1395.661	862			
Education Level	Between Groups	(Combined)	3.324	2	1.662	1.788	.168
	Within Groups		799.607	860	.930		
	Total		802.931	862			
Geographic Location	Between Groups	(Combined)	79.711	2	39.855	31.156	.000

	Within Groups		1097.581	858	1.279		
	Total		1177.292	860			
Population Group	Between Groups	(Combined)	31.200	2	15.600	21.100	.000
	Within Groups		633.604	857	.739		
	Total		664.803	859			
Gender	Between Groups	(Combined)	1.643	2	.821	2.557	.078
	Within Groups		275.035	856	.321		
	Total		276.678	858			

4.6.2 *Hypotheses testing*

The second sub-hypothesis tested the relationship between socio-economic variables and social cohesion. Ho2a: There is a relationship between age group and social cohesion. Ha2b: There is no relationship between age group and social cohesion. Alpha= 5%, P(t) = 0.000 Decision: accept Ho at a 5% significance level; age group affects social cohesion. The age group affects social cohesion; hence, Ho2a is accepted at a 5% significance level. The age category with significantly different responses from the rest is shown in the table below. The responses of age group one (18 to 24 years old) were different from those of the other participants [P(t) = 0.032]. The bar graph below, with a sentiment mean of 2.24, further demonstrates that respondents in age one has a somewhat more positive opinion of social cohesion in South Africa.

Table 4-15 Age group estimates

Parameter	**B**	**Std. Error**	**t**	**Sig.**	**95% Confidence Interval**		**Partial Eta Squared**
					Lower Bound	**Upper Bound**	
Intercept	1.458	.360	4.052	.000	.752	2.165	.019
[Age Group=1]	.782	.364	2.152	.032	.069	1.496	.005
[Age Group=2]	.497	.366	1.356	.175	-.222	1.215	.002

[Age Group=3]	.387	.369	1.048	.295	-.338	1.113	.001
[Age Group=4]	.490	.381	1.288	.198	-.257	1.238	.002
[Age Group=5]	-.083	.441	-.189	.850	-.948	.782	.000
[Age Group=6]	0[a]	.	.	.	.	.	.

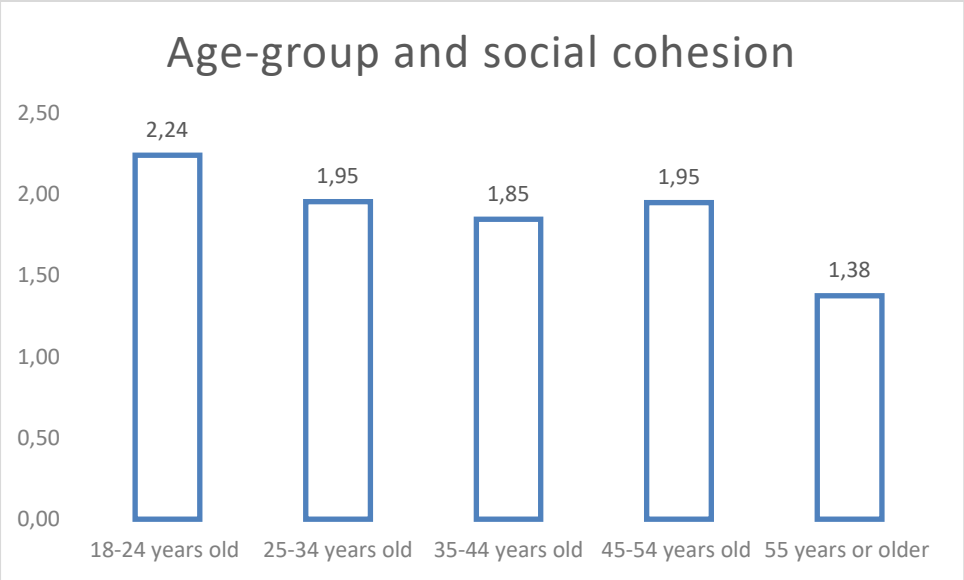

Figure 4-9 Age group and Social cohesion

Ho2b: There is a relationship between geographic location and social cohesion.
Ha2b: There is no relationship between Geographic Location and social cohesion.

Alpha= 5%; P(t) = 0.000, decision: accept Ho at a 5% significance level; geographic location affects social cohesion. The table below shows the specific geographic location with significantly different responses from the rest. The bar chart below shows that respondents in different geographic locations responded differently to social cohesion, with those living in rural areas least (1.93).

Table 4-16 Geographic location estimates

Parameter	B	Std. Error	T	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	1.439	.071	20.290	.000	1.300	1.578	.324
[Geographic Location=1]	.735	.087	8.411	.000	.563	.906	.076
[Geographic Location=2]	.932	.094	9.867	.000	.747	1.118	.102
[Geographic Location=3]	.492	.142	3.469	.001	.214	.770	.014

Dependent Variable: Social Cohesion

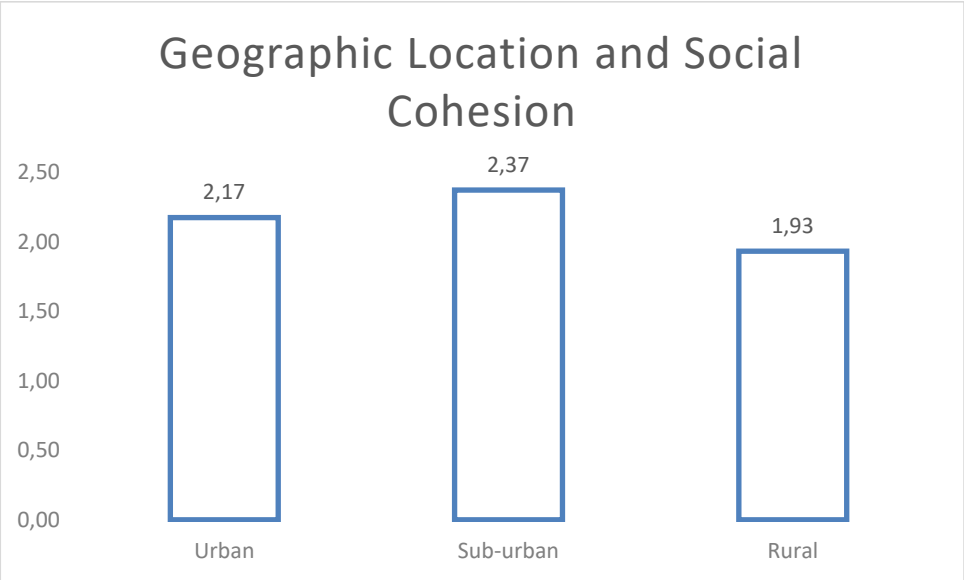

Figure 4-10 Geographics location and social cohesion

Ho2c: There is a relationship between population group and social cohesion. Ha2c: There is no relationship between population group and social cohesion. Alpha= 5%; P(t) = 0.000 Decision: accept Ho at a 5% significance level; population group affects social cohesion. The table below shows the specific population group with significantly different responses. All population groups responded differently from each other, with whites at the peak (3.10); this is further illustrated by bar chart figure 4.13 below.

Table 4-17 Population Estimates

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	2.500	.119	20.980	.000	2.266	2.734	.340
[Population Group=1]	-.631	.125	-5.057	.000	-.876	-.386	.029
[Population Group=2]	.602	.155	3.887	.000	.298	.906	.017
[Population Group=3]	-.564	.199	-2.842	.005	-.954	-.175	.009
[Population Group=4]	0[a]	.	.	.	.	.	.

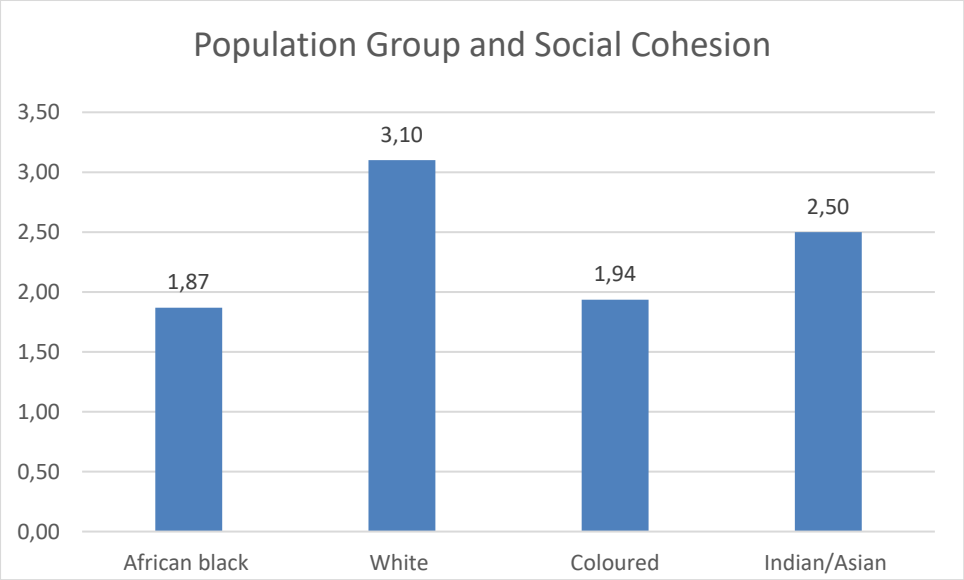

Figure 4-11 Population group and social cohesion

Based on the above and the hypotheses summary in Table 4.18, it can be inferred that socioeconomic factors influence social cohesion, age, population group, geographic location, and employment status. There is no relationship between social cohesion and gender; therefore, it can be deduced that gender does not affect the attainment of social cohesion. Based on the results presented above, the following can be deduced:

- A positive relationship exists between age group and social cohesion (p<.000).
- There is no relationship between economic activity and social cohesion (p<.321).
- There is no relationship between educational level and social cohesion (p<.168).
- A positive relationship exists between geographic location and social cohesion (p<.000).
- A positive relationship exists between the population group and social cohesion (p<.000).
- There is no relationship between gender and social cohesion (p<.078).

Table 4-18 Hypotheses summary of social cohesion and socio-economic factors

Hypotheses	Description	Result	Outcome
H_0 2a	There is a relationship between age group and social cohesion	Significant relationship found	Accept
H_0 2b	There is no relationship between gender and social cohesion	No significant relationship found	Accept
$H_0$2c	There is a relationship between population and social cohesion.	Significant relationship found	Accept
$H_0$2d	There is a positive relationship between social cohesion and education	Significant relationship found	Reject
$H_0$2e	There is a positive relationship between social cohesion and geographic location.	Significant relationship found	Reject
$H_0$2f	There is a positive relationship between social cohesion and Economic Activity.	Significant relationship found	Reject

4.7 Socio-economic factors and internet access (first-level digital divide)

The socio-economic factors that drive internet access were investigated, and it was the second question assessed the socio-economic factors that divide the digital divide. The socio-economic factors that drive access, usage, and benefits associated with being online are presented in this section. Hypothesised that there is a relationship between socio-economic factors and internet usage. The overall model fit statistics for

this test include an assessment of the chi-square likelihood ratio (of the model's fit relative to the null), Pseudo r square values, the Hosmer-Lemeshow chi-square test, and the assessment of the classification table. The binary outcome variable is internet access, where access is 1 and no access is 2.

Table 4-19 Omnibus test of model coefficients

		Chi-square	**df**	**Sig.**
Step 1	Step	120.896	6	.000
	Block	120.896	6	.000
	Model	120.896	6	.000

Table 4-19 above tests the model's fit relative to the null model. The statistical significance here means the model fits the data (*sig* 0.000) better than the null model with no predictors.

Table 4-20 Internet Access Classification

Internet Access		**Internet Access**		**Percentage Correct**
		Yes	**No**	
Internet Access	Yes	800	8	99.0
	No	34	11	24.4
Overall Percentage				95.1
Hosmer and Lemeshow Test: Chi-square =13.332, df=8, Sig.101				

Table 4-20 above shows the results of the classification model, indicating that access is labelled as one and no access as 2 (unidentified) for both observed and predicted data. In the observed data, 808 respondents were found to have internet access, while 45 respondents were not observed to have access to the internet. Regarding the model's predictions, out of the 800 individuals observed to have internet access, the model correctly predicted 99% of them to have access. On the other hand, out of the 34 individuals observed not to have internet access, the model correctly predicted 24% of them to have no access. The false positives were the 34 individuals (24%) observed

to have internet access but predicted to have no access by the model, and the false negatives were the eight individuals (1%) observed not to have internet access but predicted to have access by the model. Overall, the model exhibited high predictive accuracy at 95.1%. The Hosmer Lemeshow test, another chi-square test, assesses how well the model fits the data. In this case, the P value of 0.101 indicates that the model adequately fits the data.

4.7.1 *Logistic regression*

Direct logistic regression was performed to assess the impact of several socio-economic factors on internet access; see Table 4-21 below. The model contained six independent variables (age, gender, population group, geographic location, education level and economic activity). The full model containing all predictors was statistically significant, X2. (6, N=834) =120.9, p, <.001, indicating that the model could distinguish between respondents with internet access. The model can be explained between 13.2% (Cox and Snell R square) and 39% (Nagelkerke R squared) of variance in internet access and correctly classified 95.1% of cases. As shown in Table 4-21, only two independent variables made a unique statistically significant contribution to the model (age and education level). The strongest odds of ratio recorded are 1.66 and 1.60, respectively.

Table 4-21 Logistic regression internet access

	B	**S.E.**	**Wald**	**df**	**Sig.**	**Exp(B)**	**95% C.I.for EXP(B)**	
							Lower	**Upper**
Age	.504	.135	13.867	1	.000	1.66	1.269	2.157
Gender	-.457	.360	1.613	1	.204	.63	.313	1.282
Population Group	-.124	.341	.131	1	.717	.88	.453	1.726
Geographic Location	.469	.195	5.782	1	.016	1.60	1.091	2.341
Education Level	-1.090	.233	21.888	1	.000	.37	.213	.531

Economic Activity	-.182	.136	1.802	1	.179	.83	.638	1.088
Constant	-.296	1.467	.041	1	.840	.74		
[a] -2 Log likelihood =231.476, Cox & Snell R Square = .132, Nagelkerke R Square =.390								

Based on the results presented above, the following can be deduced:

- A positive relationship exists between age and the first-level digital divide (p<.000).
- A positive relationship exists between education level and the first-level digital divide (p<.000).
- There is no positive relationship between economic activity and the first-level digital divide (p<.179).
- No positive relationship exists between geographic location and the first-level digital divide (p<.016).
- There is no positive relationship between the population group and the first-level digital divide (p<.717).
- There is no relationship between gender and the first-level digital divide (p<.204).

Table 4-22 Hypotheses summary of first level digital divide and socio-economic factors

Hypotheses	Description	Result	Outcome
H_0 3.1a	There is a relationship between age and the first level digital divide.	Relationship found	Accept
H_0 3.1b	There is a relationship between gender and the first level digital divide.	No relationship found	Reject
$H_0$3.1c	There is a relationship between the population group and the first level digital divide.	No relationship found	Reject
$H_0$3.1d	There is a relationship between education level and the first level digital divide.	Relationship found	Accept

$H_0$3.1e	There is a relationship between geographic location and the first level digital divide.	No relationship found	Reject
$H_0$3.1f	There is a relationship between economic activity and the first digital divide.	No relationship found	Reject

4.8 Socio-economic factors and Internet use (second-level digital divide)

The socio-economic factors that drive internet use were investigated, and it was hypothesised that there is a relationship between socio-economic and internet use. The overall model is significant, F6,846= 62.085, p<0.000, the model is significant, and Ho is rejected at a 5% significance indicative of an existing relationship. The model R-square is 0.306. The adjusted R-square is 0.301, which means the model explains less than 40% of the variation in the data; anything below 40% indicates a poor fit. However, R square is particularly useful when dealing with high precision; in this case, other means, such as the coefficient parameter, may be adequate as socio-economic data is usually considered unpredictable, see Table 4-23 below.

Table 4-23 Internet use model summary

Model	1
R	.553[a]
R Square	.306
Adjusted R Square	.301
Std. Error of the Estimate	1.4784100
R Square Change	.306
F Change	62.085
df1	6
df2	846
Sig. F Change	.000

Table 4-24 Internet use coefficients

	Sum of Squares	df	Mean Square	F	Sig.
Regression	814.197	6	135.700	62.085	.000[b]
Residual	1849.116	846	2.186		
Total	2663.313	852			

Table 4-25 Collinearity diagnostics

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1.783	.363		4.911	.000		
Age	.049	.049	.031	.985	.325	.835	1.198
Gender	.123	.091	.039	1.349	.178	.962	1.040
Population group	.227	.060	.113	3.803	.000	.934	1.071
Geographic location	-.502	.052	-.332	-9.711	.000	.700	1.429
Education level	.232	.069	.127	3.362	.001	.574	1.743
Economic activity	.274	.047	.197	5.781	.000	.704	1.421

The parameter estimates were examined in Table 4.25 above. The parameter estimates the main effects (age, gender, population group, geographic location, education level, and economic activity). The estimated slope for the population group is 0.227 and is significant (t846 3.803, $p < 0.000$). This means that there is a population group difference in internet use. The estimated slope for geographic location is -0.502 and is significant (t846 = -9.711, $p < 0.000$). This means that there is a geographic location effect on internet use. The estimated slope for the education level is 0.232 and is significant (t846 = 5.781, $p < 0.000$). This means that an increase in education level also increases internet use. The estimated slope for economic activity is 0.274 and is significant (t846 = 5.781, $p < 0.000$). This means that an increase in economic activity also increases internet use. The estimated slope for age is 0.049 and is insignificant (t846 = 0.985, $p < 0.325$). This means that age does not affect internet use. This also goes for gender (no geographic effect). Furthermore, there is no

multicollinearity in the data Low condition index (<30) and low variance inflation (VIF<10).

Based on the results presented above, the following can be deduced:

- A positive relationship exists between the population group and the second level-digital divide (p<.000).
- A positive relationship exists between geographic location and the second-level digital divide (p<.000).
- A positive relationship exists between the education level and the second-level digital divide (p<.000).
- There is a positive relationship between economic activity and the second-level digital divide (p<.001).
- Age and the second-level digital divide are unrelated (p<.325).
- There is no relationship between gender and the second-level digital divide (p<.178).

Table 4-26 Hypotheses summary of the second-level digital divide and socio-economic factors

Hypotheses	Description	Result	Outcome
H_0 3.2a	There is a relationship between age and the second-level digital divide	No relationship found	Reject
H_0 3.2b	There is a relationship between gender and the second-level digital divide.	No relationship found	Reject
$H_0$3.2c	There is a relationship between the population group and the second-level digital divide.	Relationship found	Accept
$H_0$3.2d	There is a relationship between the education level and the second-level digital divide.	Relationship found	Accept
$H_0$3.2e	There is a relationship between geographic location and the second-level digital divide.	Relationship found	Accept
$H_0$3.2f	There is a relationship between economic activity and the second digital divide.	Relationship found	Accept

4.9 Socio-economic factors and benefits of being online.

The socio-economic factors contributing to the benefits of being online were investigated. Thus, it was hypothesised that there is a relationship between socio-economic factors and the benefits of the internet. The overall significance was interpreted using the model summary tables 4-27 and 4-28. The model has 5 degrees of freedom, corresponding to the 6 predictors included in the model. The overall model is significant, F6,846= 38.226, p<0.000, the model is significant, and Ho is rejected at a 5% significance indicative of an existing relationship. The model R-square is 0.213. The adjusted R-square is 0.208, which means the model explains less than 40% of the variation in the data. Anything below 40% indicates a poor fit. However, R square is particularly useful when dealing with high precision; in this case, other means, such as the coefficient parameter, may be adequate data, which is usually considered unpredictable. The RMSEA (4.92828570) should be as close to zero for the model to maintain a good fit.

Table 4-27 Third-level digital divide model

Model	**1**
R	.462[a]
R Square	.213
Adjusted R Square	.208
Std. Error of the Estimate	.79710
R Square Change	.213
F Change	38.226
df2	846
Sig. F Change	.000

Table 4-28 Third-level digital divide coefficients

	Sum of Squares	**Df**	**Mean Square**	**F**	**Sig.**
Regression	145.726	6	24.288	38.226	.000[b]
Residual	537.517	846	.635		

Total	683.243	852			

The parameter estimates for the main effects (age, gender, population group, geographic location, education level, and economic activity) are examined in Table 4-29 below. The estimated slope for age is -0.188 and is significant (t846 = -7.057, p < 0.000). It can be deduced that an increase in age is a decrease in digital benefits. The estimated slope for gender is 0.028 and is insignificant (t846 = 0.575, p < 0.565). Therefore, this suggests that gender does not have any effect whatsoever on digital benefits. The estimated slope for the population group is -0.083 and is significant (t846 -2.574, p < 0.010). It can be deduced that there is a population group difference in digital benefits. The estimated slope for geographic location is -.036 and is insignificant (t846 = -1.308, p < 0.191). It can be deduced that geographic location does not affect digital benefits. The estimated slope for education level is 0.327 and is significant (t846 == 8.769, p < 0.000). An increase in education level also increases digital benefits. Moreover, the estimated slope for education level is 0.087 and is significant (t846 == 3.419, p < 0.001). It can be deduced that increased economic activity also increases digital benefits. Furthermore, there is no multicollinearity in the data -Low condition index (<30) and low variance inflation (VIF<10).

Table 4-29 Effect of socio-economic factors in the third-level digital divide coefficients

	Unstandardized Coefficients		**Standardized Coefficients**	**t**	**Sig.**	**Collinearity Statistics**	
	B	**Std. Error**	**Beta**			**Tolerance**	**VIF**
Constant	2.508	.196		12.810	.000		
Age	-.188	.027	-.236	-7.057	.000	.835	1.198
Gender	.028	.049	.018	.575	.565	.962	1.040
Population Group	-.083	.032	-.081	-2.574	.010	.934	1.071
Geographic Location	-.036	.028	-.048	-1.308	.191	.700	1.429
Education Level	.327	.037	.353	8.769	.000	.574	1.743
Economic Activity	.087	.026	.124	3.419	.001	.704	1.421

Based on the results presented above, the following can be deduced:

- There is a positive relationship between the age group and the third-level digital divide (p<.000).
- There is a positive relationship between education level and the third-level digital divide (p<.000).
- There is a positive relationship between economic activity and the third-level digital divide (p<.001).
- There is no relationship between the population group and the third-level digital divide (p<.010).
- There is no relationship between gender and the third-level digital divide (p<.565).
- There is no relationship between geographic location and the third-level digital divide (p<.191).

Table 4-30 Hypotheses summary of the third-level digital divide and socio-economic factors

Hypotheses	Description	Result	Outcome
H_0 3.3a	There is a relationship between age and the third-level digital divide.	Relationship found	Accept
H_0 3.3b	There is a relationship between gender and the third-level digital divide.	No relationship found	Reject
$H_0$3.3c	There is a relationship between the population group and the third-level digital divide.	No relationship found	Accept
$H_0$3.3d	There is a relationship between the education level and the third level, the digital divide.	Relationship found	Accept
$H_0$3.3e	There is a relationship between geographic location and the third-level digital divide.	No relationship found	Reject

$H_0$3.3f	There is a relationship between economic activity and the third-level digital divide.	Relationship found	Accept

4.10 Conclusion

The chapter presented the results from the quantitative arm of the study. The CFA results included five exogenous variables of the digital divide, namely information search, business, career progression, religious activities, social activities and belonging, leisure/fun and social cohesion as the endogenous variable. The results suggest that social cohesion is correlated with the exogenous variables, though the strength of the correlation is different. Both information search and leisure and fun were highly correlated with social cohesion, respectively. The lowest correlation was between social cohesion, business/career, and religious activities. An interesting observation showed that the highest correlation among all the listed variables is between social activities, belonging and business/career progression. The second research question assessed the socio-economic drivers of social cohesion and the digital divide. It was hypothesised that socio-economic factors drive social cohesion and the digital divide. The results suggest that age, geographic location, and population group affect social cohesion.

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digital divide. It was hypothesised that socio-economic factors drive social cohesion and the digital divide. The results suggest that age, geographic location, and population group affect social cohesion.

The study also hypothesised that socio-economic factors drive the digital divide. The results suggest that internet access, or the first level of the digital divide, is driven by age and education level. No significant effect was found between internet access and economic activity, gender, geographic location and population group. Population group, geographic location, education level and economic activity affect the second level of the digital divide, which was assessed using usage patterns in the study. Gender, economic activity and education level did not affect internet usage. Finally, the results from the study established that age, education level and economic activity affect the benefits of being online. Meanwhile, gender, population group, and geographic location did not affect the third-level digital divide see Table 4-31 for a summary.

Table 4-31 Quantitative results summary

Research questions	**Hypotheses**	**Statistical test**	**Outcome**
What is the relationship between the digital divide and social cohesion?	$H_0$1: There is a relationship between the digital divide and social cohesion.	SEM, CFA	Accept
What socio-economic factors drive the digital divide and social cohesion?	$H_0$2: There is a relationship between socio-economic factors and social cohesion.	Regression	Partially accept
	$H_0$3: There is a relationship between socio-economic factors and the three levels of the digital divide.	Logistic regression	Partially accept

CHAPTER 5. QUALITATIVE FINDINGS

5.1 Introduction

The findings from the qualitative phase of the study are presented in this chapter. These are based on the third research question that was stated in chapter one and reiterated below:

> **Research question 3*:*** What is the perceived influence/effect of the digital divide in attaining social cohesion?

For the third research question, qualitative interviews were conducted with members of the public to delve deeper into the digital divide and social cohesion. A total of 12 in-depth interviews were conducted and can be found in Table 6-1. To collect the data, the MS Teams platform, which allowed for recording the interview, was used. The audio-recorded interviews were exported to transcription tools such as Otter and NVivo transcription software. The transcripts were then carefully reviewed while listening to the audio to ensure accuracy and shared views. The transcripts were edited to correct inaccuracies or add missing information. It is important to note that transcription tools may not capture certain nuances based on language and context. Hence, the researcher thoroughly reviewed the audio to ensure a faithful verbatim transcription.

The transcripts were carefully compared with the audio recordings and edited as necessary to ensure accuracy. After verifying the accuracy of the transcripts, the analysis process commenced. The edited transcripts were imported into NVivo software for analysis. A project was created within NVivo specifically for this study, and all transcripts were uploaded for analysis. In the initial phase of analysis, the data underwent coding. Codes were assigned to segments of data, and these codes were then organized into categories and themes that emerged from the study. The analysis employed a combination of deductive and inductive code development approaches. Table 5-2 below presents the main themes from the analysis, with further details provided.

5.2 Participant's profile

Interviews were conducted with 12 participants in the study. Of these, six were female, and six were male; their age range was between 22- 45. The participants were from different communities, including informal and urban areas. It was essential to have a heterogeneous sample that included people from other places, as often it is assumed that they do not share the same sentiments. The heterogeneous sample also provided insights into how people understand the digital divide and social cohesion. The interviews allowed for further exploration of the digital divide and social cohesion. The participants were given pseudonyms for anonymity and confidentiality purposes. As indicated in the previous chapter, the NVivo software was used to analyse the data further. A hybrid thematic data analysis method was employed. As a result, both inductive and deductive approaches to coding and theme development were employed in the study.

Table 5-1 Interviews participant information

Participant	**Gender**	**Age**
Participant 1	Male	35 years
Participant 2	Male	36 years
Participant 3	Female	43 years
Participant 4	Female	40 years
Participant 5	Female	45 years
Participant 6	Female	40 years
Participant 7	Male	37 years
Participant 8	Male	33 years
Participant 9	Female	45 years
Participant 10	Female	36 years
Participant 11	Male	33 years

Participant 12	Male	45 years

The data analysis followed a hybrid method, incorporating elements of the thematic analysis process proposed by Braun and Clarke (2005). The following steps were undertaken:

a) Familiarisation with the data: All the transcripts were thoroughly read and understood before proceeding with the coding process (as described in section 3.8.2).
b) Generating initial codes: After the initial reading, the transcripts were imported into NVivo software to facilitate the generation of initial codes. The coding process involved inductive and deductive approaches, drawing from existing literature and allowing new codes to emerge organically (Azungah, 2018; Fereday & Muir-Cochrane, 2006; Morse & Mitcham, 2002; Thomas, 2003; Tracy, 2012).
c) Searching for initial codes: Once the initial coding was complete, the NVivo software searched for instances of the generated codes throughout the data. This search process involved inductive and deductive reasoning, guiding the coding process.
d) Reviewing potential themes: The codes were then grouped into categories, following approaches suggested by Fereday and Muir-Cochrane (2006), Linneberg and Korsgaard (2019), and Saldaña (2021). These categories were carefully reviewed to identify potential themes that could emerge from the data.
e) Searching for initial themes: The reviewed categories were further analysed and refined to identify meaningful themes that could be interpreted and reported in the final research report. These themes are presented in Tables 5-2 below.

5.3 Theme Development

The themes in the study were developed deductively based on the research constructs, while the sub-themes emerged inductively from the data. The three main themes in the study were the digital divide and social cohesion. Within the digital divide theme, four sub-themes emerged: drivers of the digital divide, understanding the digital

divide, challenges associated with the digital divide, and the three levels of the digital divide. The following sub-themes informed the social cohesion theme. A detailed review of the descriptions of the themes, sub-themes, and corresponding codes can be found in Table 5-2.

Table 5-2 Summary of themes

#	**Theme**	**Description**
1	Participant's definitions and understandings of the digital divide	The participants' understanding of the digital divide from their perspective.
2	Drivers of the digital divide	the participants cited the reasons and issues they believe influence and drive the digital divide or continue to perpetuate it.
3	Bridging the digital divide	Some of the challenges or problems associated with the digital divide include both social and health related.
4	Benefits of being online	The participants identified some of the benefits they have derived from being online in the last two years – pandemic years.
5	The rainbow nation is a myth or reality.	The view of the rainbow nation as something not attainable. As pronounced often by the government but not operationalized
6	Drivers of social cohesion	The instigators of social cohesion
7	Covid – 19 is not a yardstick for social cohesion.	The participants have expressed that covid cannot be seen as an example or the cause for the perceived amplified social cohesion. Initiatives. However, some efforts suggest that people become more cohesive during COVID-19, evident in the multiple efforts that were directed at assisting those who were in need. This was short-lived and not sustained throughout the pandemic.
8	The challenges as a result intersectional between the digital divide and Covid-19	The participants shared how income and digital divide were further perpetuated during the hard lockdown.

5.3.1 *Participant's definitions and understandings of what the digital divide*

During the study, it was observed that some participants had limited knowledge about the digital divide, while others had a solid understanding of the term. Some participants admitted to having little or no knowledge about the digital divide. At the same time, a few knew its existence but could not clearly explain or articulate what it meant. However, most participants demonstrated a foundational understanding of the digital divide and were able to explain its meaning. Those with some understanding expressed that the digital divide is primarily about unequal access to internet connectivity.

> "*So, my understanding of the digital divide relates to access to connectivity in terms of having access to the internet, having access to data and being able to use the internet and being able to use emails and all the things that come with the technology. That is, in a nutshell, what I would summarise. Yes. Well, like people, some people have access to those who are typically people that are middle income to the upper class."* - **Participant 6**

One participant highlighted the importance of accessibility and the presence of an enabling environment concerning the digital divide. This participant specifically emphasised the role of infrastructure as a key factor in determining the digital divide. Infrastructure, including broadband availability and connectivity, was crucial in shaping access to digital resources. Additionally, the participant mentioned the significance of fibre infrastructure and the availability of data as fundamental aspects to consider when discussing the digital divide. These insights underscore the participants' recognition of the critical role that infrastructure and data availability play in shaping the digital divide.

> *"I understand that the digital divide is around the accessibility to a digital environment, so it speaks to the infrastructure of the digital to which you so, for instance, if we look at something like data, is data easily available to you*

in terms of affordability and the infrastructure giving the data itself? So, if we look at fibre, do you have easy access to fibre". - **Participant 3**

Another participant expressed that the digital divide is not just a current issue but also a long-term concern that will continue to impact future generations if not addressed. This participant recognised the potential long-lasting consequences of the digital divide and the need for proactive measures to bridge the gap. Their viewpoint highlights the importance of addressing the digital divide for immediate benefits and ensuring a more equitable and inclusive future for upcoming generations.

"'This is highlighted because the biggest problem here in South Africa is the cost of accessing digital technologies. And if we do not address it or go further and create a big gap between the haves and have-nots and are going to create a problem with our kids now being affected." -**Participant 12**

5.3.2 *Drivers of the digital divide*

The participants in the study shared diverse perspectives on the drivers of the digital divide in South Africa. However, there was a consensus among all participants regarding three main factors they identified as potential drivers of the digital divide: infrastructure, data cost and affordability, and electricity. Participants consistently mentioned these factors, indicating their collective understanding of these drivers' significant role in shaping the digital divide. The participants recognised the importance of addressing these factors to reduce the disparities in digital access and usage across different populations in South Africa.

I. Infrastructure

The participants in the study strongly emphasised the infrastructure issue as a prominent driver of the digital divide in South Africa. They shared that the inadequate infrastructure contributes to the digital divide and perpetuates it further. Participants agreed that infrastructure plays a crucial role in accessing the internet, and even if individuals have mobile phones, the absence of proper infrastructure hinders their ability to connect to the internet. The lack of infrastructure in remote areas was

highlighted as a significant barrier, preventing many individuals from accessing the internet. The participants viewed infrastructure as an enabling factor, emphasising its importance in bridging the digital divide and providing equitable access to digital resources.

> *"In terms of access to the digital infrastructure and resources and data, you know, so we know, especially now with the Covid. It became a problem and challenge, you know, it is becoming a big issue"* - **Participant 12**

> *"The infrastructure is not available, you know, we have all the technology we would access, even those guys from Africa".* - **Participant 9**

> *"Some people do not have access to their internet and connectivity. Those typically live in some townships, squatter camps and rural areas. So that would create the digital divide".* ***- Participant 6***

> *"…I guess the third part is infrastructure in our country also plays a big role, you know, in that there are real environments, there are previously disadvantaged areas in communities, townships, there no infrastructure to support, you know, access to these things".* – **Participant 8**

One participant specifically drew attention to the infrastructure issue in rural areas as a driver of the digital divide, particularly between urban and rural regions. They highlighted that some rural or remote areas lack full network coverage, significantly affecting residents' internet access. With adequate network coverage, individuals in these areas can make phone calls and access the internet. This discrepancy in network coverage between urban and rural areas exacerbates the digital divide and further limits opportunities for individuals in rural communities to participate in the digital world. The participant's observation emphasises the need for targeted efforts to address the infrastructure gaps in rural areas and ensure equitable access to communication and internet services for all.

“I think infrastructure has been skewed very much to the metro areas. So much of the rural, a big part of South Africa, is ageing in this right. That is access to just the infrastructure to bring those services to them. So, combining those three things creates a huge digital divide in our country. And then, air fourth, a big one, is around. What are some basic things we need to have in place, right? – **Participant 8**

“Access to infrastructure. So, if you look at rural areas, if you have any relatives at all, in the rural areas, when you visit, in some areas, to make a telephone call, you must drive out of the village to go and make a telephone call. Because there is no network within the village in some of the townships, there is no access. So, I think the issues are around the infrastructure and layout in terms of the infrastructure; secondly, socio-economic issues would create the digital divide”. – **Participant 6**

Participant 2's perspective highlights the significance of telecommunication network provider infrastructure in the context of the digital divide. They noted that certain network providers face challenges with reception in remote areas of the country. This limitation in network coverage and connectivity in remote regions is viewed as a contributing factor to the digital divide. Individuals in these areas may face difficulties accessing reliable and consistent internet services, widening the gap between urban and rural areas. The observation underscores the importance of addressing infrastructure limitations and ensuring that telecommunication network providers extend their coverage to remote areas to mitigate the digital divide and promote equitable access to digital resources for all populations.

“This is the most, you know, and it was the most trusted network in terms of having access to, even if using telecom mobile and would stay there the whole day, open your Facebook page with no network issues”. – **Participant 2**

Some participants in the study highlighted access to fibre infrastructure as another driver of the digital divide in South Africa. The unavailability of fibre, specifically the spectrum needed to support them, might significantly contribute to the divide. The

participants recognised that fibre connections offer faster and more reliable internet access, which can play a crucial role in bridging the digital divide. However, the limited availability of fibre infrastructure and the spectrum required to support it create disparities in access to high-speed internet, particularly in underserved areas. By acknowledging the importance of fibre infrastructure and the spectrum, the participants underscored the need to address these issues to reduce the digital divide and promote equal access to broadband connectivity.

> *"I do not know. So, for a long time, I thought digitally to be our answer, right? The more I have thought about it, certain things drive the more digital. As I mentioned, it is driven by electricity and fibre being everywhere. It is driven by an ability to have the information and use digital tools and things".* - **Participant 3**

II. Affordability

The participants in the study consistently identified affordability as a significant driver of the digital divide in South Africa, ranking it second to the infrastructure issue. They expressed the view that the high cost of data is a substantial barrier preventing many people from accessing the internet and contributing to the perpetuation of the digital divide. The participants recognised that the affordability of data plays a critical role in enabling internet access, and the current higher costs make it difficult for a larger population to afford regular data usage. This issue is particularly pertinent for individuals who are unemployed or have limited financial resources. The participants collectively considered affordability a crucial component of the digital divide problem, highlighting the urgent need to address the cost barriers and make internet access more affordable and accessible to all segments of society.

> *"Affordability is such a big component because I understand the inequalities of this country, and that understands that a lot because usually, many people do not have access to these things".* - **Participant 2**
>
> *"First, data is very expensive. I mean, it is expensive, and the gadget, you know, is expensive, and the government of ours is trying to rid some of them*

have some intervention. Thus, who gets prejudiced by that is the kids". - **Participant 12**

"So, affordability will come because people are unemployed. And the second one is around, you know, access to education because you might have digital access". - **Participant 8**

"So that creates that space and that gap within wider society. Suppose you think about someone who has a cell phone but does not have access to the internet, so if I stay in the township. Did you know the western part of South Africa has infrastructure challenges? And then the expense or how it is so expensive makes it very difficult for people to access that". – **Participant 2**

"I think it does because if you look at it, it does in the sense that even if you look at the affordability of data, for instance, its data is not necessarily affordable, and that is why you ended up with Telco's creating packages of getting five megabytes for you to only get five megabytes for Facebook. So that is an indicator of that.". - **Participant 3**

The participant's viewpoint underscores the significant impact of affordability on individuals' daily lives and the difficult choices they must make. They emphasised that affordability is so crucial that some people are forced to choose between purchasing data or buying food. This perspective highlights data's essential role in modern society, where access to the internet is increasingly necessary for various aspects of life, including education, employment opportunities, and social interactions. The participant's statement reflects the difficult circumstances individuals face who must prioritise their limited resources between basic needs and accessing the digital world. It emphasises the urgent need to address the affordability issue to ensure that internet access becomes more accessible and affordable, reducing the burden on individuals currently facing such challenging trade-offs.

"So, people are constantly having to choose between buying food and And maybe having access to data, and then the expense or how that is so

*expensive, it makes it very difficult for people to have access to the internet**".***

- Participant 2

Unemployment is closely linked to affordability and is a significant factor in the digital divide. Participants in the study recognised that a significant portion of the population in South Africa is unemployed, and this poses challenges in terms of affordability of data and internet access. Unemployment often leads to financial constraints, making it difficult for individuals to afford the costs associated with data and internet connectivity. This creates a barrier to accessing digital resources and exacerbates the digital divide. The perceived relationship between unemployment and affordability emphasises the need for comprehensive solutions that address individuals' economic challenges and the cost barriers to internet access. By addressing unemployment and improving economic opportunities, it becomes possible to alleviate affordability concerns and bridge the digital divide for disadvantaged populations.

"As I said, if you look at the huge inequalities of this country where people live below the poverty line, you know. Thus, people constantly must choose between buying food and maybe having access to some, but also, because people are unemployed, they do not have the resources to buy a cell phone or a laptop. So that creates that space and that gap within our society "– **Participant 2**

III. Electricity

The participants in the study identified electricity as another driver of the digital divide in South Africa. They noted that the issue of load-shedding, which refers to scheduled power outages, further perpetuates the digital divide. The availability of reliable electricity is crucial for accessing and using digital technologies. With a consistent electricity supply, individuals can power their devices, access the internet, or engage in online activities. The participants shared that the challenges related to electrical infrastructure, such as load-shedding, significantly impact people's ability to bridge the digital divide. This highlights the importance of addressing electricity infrastructure issues and ensuring a reliable and uninterrupted power supply to support digital

connectivity for all individuals, regardless of their geographic location or socioeconomic background.

> *"The electricity and infrastructure in rural Eastern Cape or KwaZulu natal. You do not get network from your Telco's."* - **Participant 3**
> *"And in some areas, know what you call this thing now, this or this load shedding or load reduction. So those things do not work because there is no electricity."* **Participant 12**

Access to electricity is a crucial factor in promoting digital inclusion. It is a fundamental prerequisite for individuals to use digital technologies and bridge the digital divide. Reliable and uninterrupted access to electricity ensures that people can power their devices, access the internet, and engage in online activities. By providing access to electricity, communities and individuals can overcome one of the barriers to digital inclusion, enabling them to participate in the digital realm and benefit from the opportunities it offers. Acknowledging the importance of electricity infrastructure and ensuring its availability is essential in fostering digital inclusion and creating a more equitable society.

> *"The more I have thought about it, it is like, but certain things drive digital. As I mentioned, it is driven by electricity and fibre being everywhere. It is driven by an ability to have the information and ability to use digital tools and things."*- **Participant 3**

IV. Literacy

The participants' perspective on literacy levels as a potential driver of the digital divide is significant. They acknowledged that even if individuals have access to devices and the internet, limited literacy levels can hinder their ability to fully understand, use, and enjoy the benefits of being online. Digital literacy, which encompasses skills related to effectively using digital technologies, accessing information, and critically evaluating online content, is essential for individuals to participate fully in the digital world. Individuals with lower literacy levels may face challenges navigating online platforms, understanding digital content, and effectively using online resources. This can create

a significant barrier to accessing and benefiting from the opportunities the internet provides. The participants highlight the importance of addressing digital literacy gaps to ensure that individuals with lower literacy levels are included in the digital age. Promoting digital literacy initiatives and providing support to enhance individuals' digital skills makes bridging the gap and promoting more inclusive digital participation possible.

> *"I think, what is the word, literacy? We also know our research, and we have many illiterate people, you know, the content behind it that I do not know. I think, you know, it is a horrible way for people who might not have access to education, what we mean by education. However, even sometimes, formal education makes you understand what you are doing. We would get a huge challenge if that. So even when someone might have a cell phone, they might not be able or allowed to use it instead to receive calls and make calls. And so many people are not trained enough to use this gadget; their dad plays a fundamental role in our community. So, people might not understand how to use the devices optimally.* **– Participant 2**

5.3.3 *Bridging the digital divide.*

The participants' insights on bridging the digital divide are valuable in identifying potential solutions and strategies to address this issue. While each participant's perspective may vary, their collective input can provide valuable insights into ways to bridge the digital divide. Considering these insights in shaping policies, initiatives, and interventions promoting digital inclusion is essential. By addressing the identified challenges and leveraging the participants' suggestions, it becomes possible to develop comprehensive approaches that foster digital access, affordability, and literacy for all individuals, regardless of their socio-economic background.

a) Reducing Data Costs

Reducing data costs is a crucial aspect highlighted by the participants in bridging the digital divide. The high cost of data can create barriers to internet access and limit individuals' ability to fully participate in the digital world. By reducing data costs, more

people can purchase data bundles and access the internet, increasing their opportunities for online engagement, learning, and economic participation. Data costs can be reduced through various means, such as government regulations, competition among service providers, and innovative pricing models.

> *"So, for me, the fact that funds that would have been allocated to creating the infrastructure to reduce, let us just the cost of data to reducing the cost of technology as a whole would have had to be litigated".* – **Participant 8**
>
> *"Think the most immediate one would make its data costs very low., I would say. OK, maybe security will come after, but improve our digital literacy and not just that from tertiary. I come from a generation where the first-ever interaction I ever had with a computer was not at school, but when I first started, like during my first year, when I started it".* – **Participant 12**
>
> *"You make policies that would work for your population, I mean, if you take costs in terms of that, comparing similar countries like South Africa, I think, well, probably one of the most expensive. I could be wrong too. Do all these things need? Political will and for tough decisions need to be made".* – **Participant 1**

b) Access to infrastructure

The participant's emphasis on the availability of spectrum and the role of political will in bridging digital inequalities is significant. Spectrum refers to the radio frequencies for wireless communication, including mobile networks and internet connectivity. Adequate allocation and management of spectrum by the government and regulatory bodies are essential for ensuring sufficient network capacity and coverage, particularly in underserved areas. Governments can play a crucial role in bridging the digital divide by prioritizing the availability of infrastructure such as fibre and investing in expanding network coverage. The participant's suggestion of political will highlights the importance of proactive measures from policymakers and decision-makers to address digital inequalities. This can involve implementing policies and regulations that encourage competition, foster innovation, and promote investment in digital infrastructure.

Furthermore, the participant's mention of a substantive drop in data costs and improved access to the internet aligns with the notion that affordable and accessible connectivity is vital in bridging the digital divide. When the costs associated with data and internet access are reduced, more individuals can afford to connect and benefit from online resources, services, and opportunities. Considering the participant's perspectives on spectrum availability, political will, and affordable access to the internet can guide efforts to bridge the digital divide. Collaboration between government, industry stakeholders, and civil society is crucial in implementing policies and initiatives that address these factors and promote digital inclusion for all.

> *"I am first and foremost; I think the willingness and. The willingness from the government is quite critical because, as owners of the spectrum from, you know, optic fibre and in telecom. We still have the biggest infrastructure in the country. We know the government partly owns it, and much as they try to make, you know, playthings like that affordable,".* – **Participant 6**

> *"The second part is it talks to just employment and giving people access to funds to be able to, you know, access these things, right? Because even if we bring it, it is just there now. Your service providers and manufacturers can manufacture affordable, Mm-Hmm. I can only buy a smartphone if I have money to do so. So, if I am not working and I do not, you know, unable to do that, I cannot buy it. Once again, I am and keep talking about cell phones because they are the most accessible technology; they continue to open the world to many people".* - **Participant 8**

c) Policies and government reform

Several participants highlighted the importance of ensuring fair and equal access to infrastructure. They suggested that the government should invest in and expand the telecommunications infrastructure, especially in remote and rural areas. This includes ensuring all areas have access to network coverage and an adequate electricity supply to power the infrastructure. Participants also mentioned the need to prioritise the rollout of fibre infrastructure as it offers faster and more reliable connectivity than traditional copper cables. They suggested that this can be achieved through public-

private partnerships or by incentivising telecommunication companies to invest in infrastructure development in underserved areas. Furthermore, some participants suggested that the government should provide subsidies or tax incentives to make internet services and devices more affordable for low-income households. This could include zero-rating certain services or providing free data for educational purposes. Overall, the participants highlighted the need for a multi-faceted approach involving government policy reforms, private sector investment, and community engagement to bridge the digital divide in South Africa.

> *"I think everyone there has their responsibilities because, for example, the government must ensure infrastructure is there so that you can have reliable access to individual corporate individual also needs to take responsibility; it is like a dog eat dog out there. So, its technology is one thing that always keeps changing and keeps evolving and growing and growing and growing".* - **Participant 11**

Participant 3 added that innovative solutions could help ensure the infrastructure is utilised effectively and distributed equitably. This could include community-based Wi-Fi networks, shared access points, and other initiatives that help expand internet access beyond traditional means.

> *"I think there are ways in which we can deal with it. However, I also think an issue of, we need to be more innovative around these things. Looking at infrastructure, have we genuinely been innovative in solving for infrastructure in South African? We understand that our infrastructure is concentrated in suburbia. That, still, infrastructure was from a heartbeat and was only given to suburbia. When I thought about this infrastructure, have we sold for it? Guess what? Even the census did not count 48 million other people when that infrastructure was there. Now you cannot say 24 years later because, even when you planned in those years, you were only planning for 5 million people must recognise that the planning volume fundamentally differs from the volume we have traditionally planned for. And we cannot. That infrastructure cannot carry all of us".* - **Participant 3**

> *“I think public and private sector need to come together decisively in terms of how we sort out things related to infrastructure, things related to education, things related to access to data, all of those things and the regulation around all of that for us to be able to print digital data to more people”. -* **Participant 8**

Implementing fibre in townships is a positive step towards bridging the digital divide. It can provide faster and more reliable internet connectivity to communities that may have been underserved in the past. However, as mentioned by the participant, there can be limitations and challenges associated with this implementation. Some of the limitations include the availability of infrastructure in certain areas and the cost of installing fibre. It is important to address these challenges to ensure that the benefits of fibre connectivity are accessible to all communities, regardless of their location or economic status. Participants may have suggested exploring alternative approaches and leveraging existing infrastructure or wireless technologies to expand access to high-speed internet in areas where laying fibre may not be feasible or cost-effective.

> *“They liked the idea of fibre coming into the community because of the amount charged for fibre compared to when you are in the suburbs. It is a lot less than when you would be charged. It is a lot in Soweto compared to when you would have been in the burbs. Furthermore, some contractors were unhappy that fibres were coming into communities, and others said fibre is good for our communities because it will speed up many things. I have given you examples of my house and what we do. And it has been a good thing. However, the only downfall of it is, is the fact that other people. Oh, there is no sharing; let me put it that way. My things are my things, and there is no sharing between your things. So, for us to be able to be equal”. -* **Participant 5**

d) Literacy levels and access to information

Bridging the access divide is essential, but more is needed to address the digital divide fully. The next level involves addressing the skills gap, digital literacy, and education. Access to information is only useful if people know how to use it effectively. Therefore,

training and educational programs on using the internet and digital technologies can bridge the digital divide and empower individuals to use these tools to improve their lives.

> *"Learning material that is out there is available. Many learning materials companies give me, giving away courses and everything else. But only if you know about it; if you do not know about it after some tough luck, you must pay and then at something else more exposure to what is available."* - **Participant 11**

> *"The second thing is education and awareness, willingness to educate people around the benefits and understanding the importance of technology and what role technology can play in their lives".* – **Participant 6**
> *"You know, learning a lot, you know, and what I am exposed to also contributes to, as I said earlier, my outlook and my education. So, I think I think education, a big part of IT infrastructure, would be part of it".* – **Participant 8**

> *"At the very basis of education, just when they start college and they get introduced not just to like play laptops, but if, you know, do significant things that are useful and not just for playing games and whatnot and educate people".* – **Participant 12**

> *"Digital literacy and financial education are crucial in bringing these things together. And then I think. There also needs to be a big drive from the education perspective. Remember, younger people are more and a broad statement, I know. However, younger people are more. I guess they are open to learning about technology; they seem to be. I do not remember generationally; it looks a lot easier to engage and understand how to navigate this world is the end of the person. So, it must be studied at grassroots levels as well, right? And an education perspective.* ***– Participant 1***

> *Furthermore, it should not matter whether you are in a multiracial, private, or village school. For example, we should be able to provide access to*

technology across the board because, in my mind, which opens many opportunities, reducing this. This huge divide of because of good access to technology, have good exposure to so much more, and therefore I am lined up to do a lot better in life versus I do not have access to that". – **Participant 8**

5.3.4 *Benefits of being online*

Participants have gained insights into the advantages and disadvantages of being online in the past year. This highlights the evolving nature of digital experiences and the need for ongoing learning and understanding. The pros of being online include access to information, educational resources, communication with others, and various online services. On the other hand, the cons may involve privacy concerns, misinformation, online harassment, and the potential for addictive behaviours.

a) Convenience

They have cited convenience as a benefit of digital inclusion. The ability to perform various activities from the comfort of one's home, such as attending meetings and shopping online, can save time and eliminate the need for physical travel. By leveraging technology, individuals can connect with others, access services, and accomplish tasks efficiently, regardless of geographical constraints. Moreover, digital platforms offer flexibility and accessibility, enabling individuals to engage in activities conveniently. The convenience of digital inclusion contributes to increased efficiency, productivity, and accessibility in various aspects of life.

*"You know, let us develop strategies to make sure that our company now focuses, you know, in making sure that we put everything on like, you know, I now have what my bosses, I now hold meetings every Monday and Tuesdays online, which they are supposed to go physically"***. - Participant 2**

b) Connection and socialising

The participants recognised the convenience issue as a benefit of digital inclusion. The ability to perform various activities from the comfort of one's home, such as attending meetings and shopping online, can save time and eliminate the need for physical travel. By leveraging technology, individuals can connect with others, access services, and accomplish tasks efficiently, regardless of geographical constraints.
Moreover, digital platforms offer flexibility and accessibility, enabling individuals to engage in activities conveniently. This can be particularly valuable for individuals with mobility challenges or those residing in remote areas with limited access to certain services. The convenience of digital inclusion contributes to increased efficiency, productivity, and accessibility in various aspects of life.

> *"I can create efficiencies in my lifestyle to do online shopping. I can do all sorts of things with all these tools that support my lifestyle".* **– Participant 3**

> *"I do not need to get into the car to spend six hours at the shops because I must check on the fruit market, the clothes store, and whatever I can do within 30 minutes. Furthermore, I can create such that my lifestyle has changed and connect more globally so I can speak to my friends in the U.S. and the U.K. Those are the things. And then, I use them for other things like health awareness and checking my period. I know something is wrong. I need to go for a check-up".* - **Participant 3**

During the challenging lockdown period, one participant emphasised the importance of being online or having digital means to connect with loved ones. They found that digital communication tools such as video calls, messaging apps, and social media platforms played a crucial role in staying connected with family and friends when physical visits were impossible. These digital avenues provided emotional support and helped mitigate feelings of isolation and loneliness during difficult times.

> *"I have been told I come from a community where people are not necessarily a community, but families where we visit each other often. Furthermore, we are COVID; we did not see each other often. Moreover, our extended families*

have missed out because I am comfortable with my mom and sisters and what not to non-digital. So, we missed them, and we could not visit or see them. Furthermore, I think it is like separated families in a way. Because we could not see each other, and we could not connect if they did not have data, or they did not have smartphones or laptops to video call. So, it limited our conversation, which is limited. Yeah, you have limited interaction with". – **Participant 4**

5.3.5 *The intersectionality between the digital divide and Covid-19*

Amidst the difficulties of the lockdown, a participant highlighted the significance of being connected online or having digital resources to maintain contact with loved ones. They expressed that digital communication tools like video calls, messaging apps, and social media platforms played a vital role in staying connected with family and friends when physical visits were not feasible. By utilising these digital avenues, individuals could receive emotional support, combat feelings of isolation, and alleviate the impact of social distancing measures during challenging times.

"Yeah, and I keep saying COVID was an amplifier of things we already did. We knew that somebody in a better income bracket or who could create income for themselves before COVID could easily do certain things. They could easily start a business; they could easily change their career. They could easily change jobs because that is the name of the game. Finding another job is easier once you are in a job, but it is always hard to find your first job. Furthermore, it is the law of attraction. I do not know". ***- Participant 3***

Most participants shared the same view regarding the effect that covid 19 has had in further perpetuating the digital divide. Education was cited as one of the key sectors affected by COVID-19, perpetuating the digital divide in many communities.

"*The second aspect for me, I have mentioned it, but education continues to be that because if we are yes and no, you can go ahead of education on a broader scale. So, we also know that people who have access to better education in*

our country are the guys that we have access to technology, and they have access to data, they live access to computers". - ***Participant 8***

"And it has impacted the levels of inequality because, during the pandemic, people from less fortunate schools could not attend school for a couple of months, and other kids could attend online classes. They could continue with their syllabus, while most public-school kids did not have that opportunity. And in case you. Income and expenditure." ***– Participant 1***

In addition to highlighting the education divide, participants have raised concerns about health inequality. They expressed that the COVID-19 pandemic has exacerbated existing health disparities within society. With the increased reliance on electronic communication during the pandemic, important health information and updates were primarily disseminated through online platforms. This created a barrier for individuals who need internet access, limiting their ability to receive timely and critical health information. As a result, those who lacked the means to connect online experienced further disparities in access to healthcare resources, guidance, and updates related to the pandemic.

The participants highlighted the significance of accessing health information, particularly during the COVID-19 pandemic. They shared their experiences of using online platforms to stay informed about essential health guidelines, preventive measures, and updates related to the virus. The convenience of accessing accurate and timely health information online was highlighted, enabling them to make informed decisions about their well-being. Additionally, participants mentioned the advantages of virtual healthcare services, such as telemedicine and online consultations, which allowed them to connect with healthcare professionals remotely. They recognised that digital connectivity was crucial in accessing vital health resources and services during the pandemic.

"It is quite a few things where you failed to conclude, and by that, you create inequality. I look at the current pandemic where people failed to access information, and by failing to access it, they could not resolve whether they

wanted to vaccinate. Furthermore, that is inequality, where they do not have safe platforms to engage around the pandemic. That is health inequality". ***– Participant 3***

"The digital divide, so this became more apparent now with the time of Corona NI, the state that we did not prepare for, we find ourselves in, and it, you know, people are so reluctant to go into the digital space." ***– Participant 9***

One participant highlighted the effects of the pandemic on online food and e-commerce, suggesting that the crisis may have expanded the customer base for these services. However, they also pointed out the challenges faced by individuals in the informal sector who lack the necessary means, technology, and literacy skills to compete in this digital landscape. The participant shared the disparity, with some individuals benefiting from the online market while others struggle to adapt and sustain their livelihoods.

"If anything is just magnified it, those pre-existing issues; yeah, it has made it even more intense in the sense that I mean the very topic, you know, like shopping, let us see in an example of that what had locked down so people that like that you know make their living by buying fruits in certain markets and selling them on the pavement. Suddenly like that, that was taken out of the picture but up the road, people could still access, you know, like, fresh vegetables and all those things via big retailers through digital platforms like your Take-A-Lot and Uber Eats. Yet on the other side, that person that, like, now is locked into a house because that is the only way at that moment that they can, you know, like generating income now suddenly that cannot generate an income, so basically, now you can put food on the table. Whereas you know a few less than a kilometre across the road, many of you know that other options were to generate income, so it is magnified". ***- Participant 7***

"It means this day if we look at the law states it is a reporting quarter on the quarter you can seem like the rate of unemployment and poverty keeps on increasing in the country because of you know, like businesses that like were

stable before the pandemic some could not even make it out of the very like face type lockdown. For about 50 or odd years, these institutions could not come out of that. Yeah, it has exacerbated like what pre-existed, if I can call it". - ***Participant 7***

"What then happened is the unfortunate reality around COVID is the people in the higher income brackets could if you look at me where, unfortunately, and I think, the country's top 15% earners. I was the one who could then easily work from home without losing my source of income. I had the infrastructure to work from home. I had the fibre, a secure place, and that type of thing. Whereas if I look at my own company, the lady working at the call centre could easily transition to working from home because her first thought was that it is unsafe for me to carry this to work". ***- Participant 3***

5.3.6 *Rainbow Nation a myth or reality*

Most participants expressed scepticism regarding the attainability of the concept of a rainbow nation. Despite the government's efforts to foster unity and inclusivity over the years, the participants viewed it as a mythical and unattainable idea. One participant even compared it to a unicorn, emphasising the perceived superficiality of the concept. They pointed out that if the rainbow nation existed, there would not be calls for an independent republic in certain provinces. The participants believed that the notion of a rainbow nation was a dream sold without a concrete action plan.

"Rainbow nation exists because you did not have some within our society who wanted to live under an independent republic inside Africa. This thing was not for us". **– Participant 1**

They expressed that the idea of a rainbow nation was promoted and emphasised during the transition to democracy in South Africa. However, they viewed it as a dream sold to the people without adequate follow-through or tangible actions to bring true unity and social cohesion. The participants believed that the concept of a rainbow

nation lacked substance and failed to address the deep-rooted socio-political factors that continue to hinder social cohesion in the country.

> *"I think it was a dream sold to him like, you know, and many people, which I think at the time, it was an ideal, if I can call it that, that they like having had the previous apartheid era. So, this concept means we must look beyond those differences to make music collectively to shape a better future or life. I think the ruling party was one of the key things for them. They were campaigning for a better life for all. Then you had, you know, like sporting meaning in their sporting environment, this printworks, I think a year after the elections won the World Cup, and you saw people like hugging, and everything looked hunky-dory. However, I think we had the coldest matches of all those things. It is all it was all being. It was structured in a sense that much as we were now moving into a democratic dispensation, so you had like a new and new party that we now like the ruling party like with no credentials in terms of like running, you know, like something as complex as running a government. However, like economically, you still had, you know, like those like white, or what we call inequality".* **– Participant 7**

> *"Look, I think to look, I think. Before 1994, our parents had much excitement about democracy. You know, I usually make this comment. That is when your father voted or voted going out and voted. They are voting men who will now be equal to white people. Furthermore, you know, I do songs as little as you like what you know, you want to be quite white. Hopefully, I will get to the shop and buy it. Moreover, he complained about being told that this soft to attract more means he will go and catch a bus, not pay the bills, go to the beach, and sue me because I did one myself. I want our parents to vote in my assessment of the Olympics that we can talk about and need quality and that 1% is not allowed onto a smartphone. When I say this, OK? Furthermore, I think that before me, I was sold by now, even Nelson Mandela. We shall be equal and all of that. And so. However, we were not told that political freedom, usually equated to quote, was not getting that economic freedom".* **- Participant 2**

5.3.7 *Drivers of Social Cohesion*

The participants generally believe social cohesion is an ideal concept but not realistically achievable in the country's current state. They express the belief that South Africa lacks true cohesion as a nation. They perceive social cohesion as superficial and limited to specific events, such as soccer matches, where a temporary sense of unity may be experienced. However, they assert that beyond these isolated moments, underlying socio-political factors hinder the overall social cohesion of the country.

> *"Social cohesion is like a panacea where you hope people eventually get along. People eventually accept and. It is a norm that they are where they are socially, but we can all live together, and it is not a virtue. The other things do not exist, but we happily live with them. I think it is like a panacea. It is not an achievable thing".* - **Participant 3**

> *"If we were if we were essential. Cohesive country. You would hear of people being shot found because we thought they were in 1970. Hmm. Or you would even find a situation where we used to own a farm, and then we decide that we are selling it, and then people that with being on that land and their previous family members, we think they are for more than 40 or 50 years need to be reached that way. Do you think those people will go if they feel they left it? So, people would not be treated like animals if there were social cohesion".* **– Participant 1**

> *"So, we do not create sustained social cohesion solutions. If we had found a methodology to make it a sustained solution, I would say yes, but because it is not, it was ad hoc. It was at that time, and I would not call it social cohesion".* **– Participant 6**

According to the participants, the lack of sustained effort towards social cohesion has made it seemingly impossible to achieve. They believe achieving social cohesion requires ongoing and deliberate actions, policies, and initiatives promoting unity, understanding, and equality among different social groups. However, they perceive a lack of such sustained efforts, contributing to the perceived unattainability of social

cohesion. The participants highlight the need for continuous commitment and active measures from various stakeholders to address the underlying challenges and divisions that hinder social cohesion in South Africa.

> *"I am just saying, for me, if we, if we wanted social cohesion, social cohesion has got to be sustained, there has got to be some level of sustenance, in what we do, it cannot be just once off when they need, and the need is heightened. Because, yes, there was the need. Furthermore, we all supported, but what has happened to those people giving food parcels to now".* **– Participant 6**

> *"And I look at there is a just a lot. There is no such thing as a rainbow nation. People are fake. We create flakiness. Furthermore, it is an illusion. Not being true or being themselves, the minute you become true to become yourself or your truest form".* – **Participant 5**

> *"South Africa, when it comes to things like soccer, like any sports, let me put it that way. We are united, guys. Oh, since we love the real economic issues. That is where the problem starts. That is where reality hits us. So as much as this rainbow nation or social cohesion is just for the Office, we can live better among each other to further stats. Let me put it that way".* **– Participant 5**

> *"And the answer for me is social cohesion. We all like to think of it, and we love the idea. Moreover, when watching sports, we get a nice sense of what that could be. However, we have so many foundational issues that we need to sort out to enable that dream to materialise essentially".* **- Participant 8**

> *"Helped with social cohesion because it was not just the organisation in inverted commas. It put a performance problem, right? It was affecting businesses. It affected communities, affecting individuals regardless of race, income, wealth, etc. For me, I do. I saw the public and private sectors coming together to say, how do we solve these things for this big crisis? It seems to save people's lives, put food on people's tables, and ensure we survive it right with as little impact as possible. In my view, it did. Furthermore, I guess we*

should. It should never be a crisis for us to be able to do that. However, we know that the crisis does kind of trigger innovation. So, it would be great if we tackled, you know, a lot of the challenges that South Africa has in a very similar fashion. You know, working together for the greater good of the South African people". **- Participant 9**

"I think it is the society being able to cooperate or integrate and work with each other concerning your health outcomes, the economic, your education outcomes? Yeah, I think that that that would be my understanding of social cohesion". – **Participant 6**

Some participants expressed their understanding of the Rainbow Nation as a nation-building society that seeks to unite people from different cultures and backgrounds within South Africa. They believe that idea was initially embraced during the transition to democracy as a vision of inclusivity, reconciliation, and harmonious coexistence. However, they also acknowledged that achieving a rainbow nation has been challenging. They mentioned that despite the initial optimism, social divisions, inequality, and ongoing challenges have hindered the realization of a fully integrated and cohesive society.

"My understanding of the rainbow nation is that we are a nation made up of different cultures, different people from different backgrounds and Asians in a nation with different backgrounds, that has colourful backgrounds, and that makes up this nation. Furthermore, we must assume that Rainbow Nation means that the past is forgotten, and we hope for our nation. However, we see that Rainbow Nation was a colourful nation, but not united". **– Participant 4**

"You see, glimpses of those may not be to see we not socially cohesive would be I do not think it would be the correct you know, like, the representation you see still see, you know, like, you know, people like to put it. People across races and races that we know ladies' communities, which I think have worked hard irrespective. Like where we come from or the previous, you know, like a regime that has worked well too, you know, like narrow the gaps from a socio-

economic perspective, but it is just a very small, you know, like my it is a very it is almost a drop in an ocean if I can call it that way we see that you know communities pulling up pulling together to make you know to lay the lives to be better and to ensure that safety sees you know how often they come best practice like best practices are implemented in in in in in in areas in which they live in, but on the greater scale of things you still have people that like looking after their interest and interest not necessarily economically, but you know the play". **– Participant 7**

5.3.8 *Barriers to the attainment of social cohesion*

The participants have identified several factors that they believe are barriers to achieving social cohesion in South Africa. One prominent factor mentioned is unemployment, which they perceive as a significant obstacle. They expressed concern that high levels of unemployment create social inequality, economic disparities, and feelings of marginalisation among different groups within society. They believe that with adequate employment opportunities and economic stability, it becomes easier for individuals and communities to unite and work towards a shared sense of cohesion and unity. The participants emphasised the importance of addressing unemployment as a critical step towards fostering social cohesion in the country.

"Unemployment. As for me, I will give you an example. I have a sister who has been unemployed for God knows how long, and one of the things I have said to her is, you have. You, you, you are present, because so many degrees in life, she said she is a fine artist. Just tourism, she is got to teach her degree. She is, like, all my siblings. She is one person who is quite a lot of qualifications. And endless. However, they tell her you are overqualified whenever she seeks a job., I remember telling her that if they said you were overqualified, why don't you start something with your hands? What is the qualification that you have studied for? Why don't you start something? Where does the problem come from? Because people do not know what to do with themselves. Our community can have all the qualifications. However, if you do not know how to utilise what you have started for, that is where the problem comes in". **- Participant 5**

The participants have highlighted the socio-economic landscape as another significant barrier to achieving social cohesion in South Africa. They recognise that socio-economic conditions and challenges persistently hinder progress despite efforts to foster social cohesion. Issues such as income inequality, poverty, lack of access to basic services, and disparities in resource distribution were key factors contributing to social division and preventing the realisation of social cohesion. The participants believe that addressing these socio-economic issues and promoting equitable opportunities for all citizens are crucial steps towards overcoming barriers to social cohesion in the country.

> *"People across races that we know ladies' communities, which I think have worked hard irrespective. Like where we come from or the previous, you know, like a regime that has worked well too, you know, like narrow the gaps from a socio-economic perspective, but it is just a very small, you know, like my it is a very it is almost a drop in an ocean if I can call it that way we see that you know communities pulling up pulling together to make you know to lay the lives to be better and to ensure that safety sees you know how often they come best practice like best practices are implemented in areas in which they live in, but on the greater scale of things you still have people that like looking after their interest and interest not necessarily economically, but you know the play".* **- Participant 7**

According to some participants, the government's perceived lack of decisive action and commitment to fostering social cohesion is a significant barrier to achieving cohesion in the country. They believed the government should take a more proactive role in promoting social cohesion by implementing effective policies, programs, and initiatives. Participants felt that strong leadership and concrete actions from the government are necessary for the challenges and divisions within society to persist, hindering progress towards social cohesion. They emphasised the need for the government to prioritise social cohesion as a national agenda and take tangible steps to address the underlying issues and promote inclusivity and unity among the diverse population of South Africa.

“My other barrier is that government fails to engage. I think our government does much talking about us. It does not talk to us. It talks to us like this is how it is going to happen. However, I voted for you in a way to get into the media. So, the government also becomes a barrier in that has the government genuinely *created a platform for us to collaborate and build the country? If you look at some of the things that government does, for instance, you look at these structures, these traditional healers, a business for South Africa, these workers' unions, these whatever, and you look at all those structures. Furthermore, even when the president was looking”.* **- Participant 3**

“I think we struggle with accommodating each other, and I think again, that is one of the factors that we are deeply entrenched during apartheid. So AmaZulu stands for specific things, and my boss, I am a vendor. We are starting to see a little bit of a shift. However, many other things are coming to the fore as society advances and as people start to become open around these multicultural issues that I do not think we fully embrace”. – ***Participant 6***

5.3.9 *Perceived impact of covid-19 on social cohesion*

Some participants noted that during the initial stages of the COVID-19 pandemic, there was a sense of increased concern and unity among people as they came together to face the common challenge. However, they emphasised that this temporary display of cooperation and assistance should differ from true social cohesion. They believed that social cohesion is a long-term and sustained process beyond moments of crisis. While the initial response to the pandemic showcased a collective effort, they believed that genuine social cohesion requires ongoing efforts and a deeper understanding of the underlying social, economic, and political issues contributing to social division and inequality. Merely coming together in times of crisis only sometimes ensures lasting social cohesion, which requires a deeper and more comprehensive approach.

“That is quite true. And do you think, when COVID started, there was much help from cooperating people who would pull resources together to help those

in need, and some argue that, you know, that is a sign of social creation? Do you think COVID or COVID-19 made South Africans more socially cohesive"? **– Participant 5**

"I would rather when we started COVID; it was when we started supporting the people under distress, right? It was calculated that it could be sustained to ensure we first know whom we support for better coordination. We also know their contribution, so this month is not a one-off. I will go and buy groceries at Macro and go ahead and drop them off at this place where there is a need. Rather, we say we are working on a plan to say we have this crisis; we do not know how long it will last. However, we also know that we have so many people in distress who need support. Furthermore, we create resources that will work and stretch over time to create the impact we need. So instead of me going to buy off one of the groceries for R6000. I stretch that R6000 over a couple of months and pull with other people, but we still make sure that the people like we have, again, Joy coordinated effort in terms of those people receiving food over a 24- or 36-month period, until something changes in their lives". **- Participant 6**

Participant 6 echoed the sentiment expressed by Participant 5 regarding the initial sense of social cohesion observed at the beginning of the pandemic. Additionally, Participant 6 acknowledged that the complexity and dynamics of South African society contribute to the challenges in achieving social cohesion. While the participants acknowledged instances of social cohesion during the July 2021 riots, such as people working together to protect resources, they shared that these acts alone do not encompass the entirety of social cohesion. They recognised that social cohesion is a multifaceted and ongoing process that requires sustained efforts and addressing underlying systemic issues.

"You know, I think we are a very complex society in our give you a different society, a different example, which I think moved all of us during the recent riots, in case there, in housing, around how the tax is stepped in and protected the communities and decided to protect the shopping centres in the assets

within the townships or wherever they were. So, one would look at it and say, wow, so it was such an important message for me. Furthermore, it spoke to me because we all have a particular attitude towards taxi drivers. Moreover, when they decide to step out and say no, not under our watch, we will not allow this. I was like, Wow. So, returning to the issue of food parcels being distributed to people. If it were a sign or a sustained effort to ensure that those people continuously had food, I would say yes, we were going somehow. It typically tends to be once or very short term when needed. We do not create sustained social cohesion solutions. If we had found a methodology to make it a sustained solution, I would say yes, but because it is not, it was ad hoc. At that time, I would not call it social cohesion". **- Participant 6**

Participant 7 expressed the belief that the COVID-19 pandemic has exacerbated the challenges of achieving social cohesion in South Africa. The participant identified the widening gap between different socio-economic groups due to the pandemic, leading to increased inequality levels. They emphasised that the pandemic further amplified the existing disparities and divisions within society, making social cohesion even more elusive.

"Let us see what had locked down in an example if anything is just magnified, those pre-existing divides." **- Participant 7**

Participant 7 raised concerns about establishing the solidarity fund during the COVID-19 pandemic. They argued that while the fund was intended to assist, it inadvertently created a welfare state and a mindset of dependency. The participant expressed that relying on external support can hinder the development of self-reliance and resilience within society, which are important factors for achieving social cohesion.

"The solidarity fund was formed in which is still well run, you know, the food passes that were taken but that is not sustainable while one of the how like things that do not sit well with me s creation of almost a welfare state. People have pride. I was raised by two hard-working parents who are not the most educated or paid, you know, like people in the whole world but the image they

will like the awake ethic. Then they took pride in like, you know, working hard in order to, you know, like provide for us but also ….what would give us dignity as underprivileged people give us like, you know, a piece of land and like, and like you know, afford us opportunities, where we can like to fend for ourselves, make it conducive for us to be able to thrive. You know, like build ourselves, you know, like homes that we don't give me like, you know, like a 50 square meter house that's like, like to the way the workmanship is not you know, even up to standard and then they expect me to vote into power the next time and wait for another five is when you make promises and all of those things, things. I think for me before 1994. I was exposed to people working very hard to make ends meet and more regularly seen, even with the social relief grant, that we think fit the 350 frontiers equally. There is, for me, does not like to help it. If anything, it just makes things even more difficult." **- Participant 7**

5.4 Conclusion

The chapter presented the qualitative findings obtained from interviews conducted with 12 participants from the public. The data analysis followed a hybrid approach, combining inductive and deductive methods through thematic analysis. As a result, nine themes emerged from the findings. Within the context of the digital divide, the participants' views and understanding of the digital divide, drivers of the digital divide, and the benefits of being online were explored and identified as key themes. These themes were further linked to the broader concept of social cohesion. Specifically, the themes of the rainbow nation, barriers to attaining social cohesion, and the perceived impact of COVID-19 on social cohesion were discussed see Table 5-3 below.

The chapter provided a detailed analysis of the participants' perspectives, illustrating their understanding of the digital divide and its drivers and exploring the potential connections between it and social cohesion. The impact of the COVID-19 pandemic on social cohesion might have been presented, highlighting its influence on the identified themes.

Table 5-3 Summary of themes and constructs of the study

Construct	Themes
Digital divide	Participants' understanding of the digital divide
	Drivers of the digital divide
	Bridging the digital divide
	Benefits of being online
	Challenges because of the interaction between the digital divide and covid -19
Social cohesion	Rainbow nation
	Drivers of social cohesion
	Barriers to the attainment of social cohesion
	Perceived impact of covid-19 on social cohesion

CHAPTER 6. DISCUSSION OF THE RESULTS

6.1 Introduction

This chapter discusses the research findings concerning the existing literature. It will specifically focus on the quantitative results presented in Chapter Four, which were based on survey data, and the qualitative findings from Chapter Five, which were derived from the interviews conducted with participants. The chapter draws upon the literature reviewed in Chapter Three to provide a contextual view for analysing and interpreting the research findings. By examining the three research questions originally posed in the first chapter, the discussion will explore how the results align with or contribute to the existing body of knowledge. The quantitative phase of the study informed the first two research questions, while the qualitative phase addressed the third research question. The chapter will comprehensively discuss the findings presented in the previous two chapters, examining their implications, relevance, and potential limitations. It will also identify areas where the findings support or challenge existing literature and propose directions for future research.

> ***Research question 1:*** *What is the relationship between the digital divide and social cohesion?*
> ***Research question 2:*** *What socio-economic factors drive the digital divide and social cohesion?*
> ***Research question 3:*** *What is the perceived influence/effect of the digital divide in attaining social cohesion?*

The chapter is organised based on the research questions initially introduced and presented in chapter one. It begins by restating and exploring these research questions in more depth. The chapter then revisits the main hypothesis proposed in chapter one, examining how the findings align with or contribute to its validation. Furthermore, the theoretical frameworks presented in Chapter Two are revisited and discussed with the research findings. Overall, the chapter serves as a comprehensive discussion and synthesis of the research findings, linking them to the research questions, hypothesis, and theoretical framework. It evaluates the study's outcomes

and offers insights into the broader significance of the findings within the research field.

6.2 Discussion

6.2.1 *Discussion in relation to the RQ1*

The first question explored the relationship between the digital divide and social cohesion. The results did find a correlation between the digital divide and social cohesion. This suggests that the digital divide affects social cohesion, as established in Chapter 4, section 4.5 above. Based on the preliminary literature review and as presented in chapter two, several studies have examined the relationship between two constructs, either social cohesion or the digital divide (Balkan & Adalier, 2011; Beckers et al., 2003).

Research suggests that there is a relationship that the digital divide impacts the attainment of social cohesion significantly (Cantabrana et al.,2015; Wallace et al., 2017). Williams (2013) found that bridging the first level of the digital divide, which is concerned with access, increases the attainment of social cohesion. In another study, (Beckers et al., 2003) found that the effect of digital inclusion on social cohesion can be attributed to other socio-economic factors such as income and level of education. Ling (2010) found that using information technology for communication contributes to reshaping social cohesion. The digital divide, coupled with other factors, can inhibit the attainment of social cohesion. Therefore, more understanding of the factors that hinder or impede the attainment of social cohesion in South Africa needs to be explored.

6.2.2 *Discussion in relation to RQ2*

The second research question investigated the relationship between social cohesion and socio-economic factors. The socio-economic factors considered in this study included age, gender, population group, education level, economic activity, and geographic location. It is important to note that the discussion will primarily concentrate

on the relationship between social cohesion and the identified socio-economic factors, excluding other variables or constructs that were not directly relevant to the research question. This focused approach allows for a deeper understanding of the factors that may impact social cohesion within the study population.

Socio-economic factors and social cohesion

The Pearson correlation test explored the relationship between social cohesion and socio-economic factors. The results showed socio-economic factors influencing social cohesion, age, population, and employment status. The results from the study suggest that age does influence social cohesion. Literature suggests that age is one of the determining factors of social cohesion. Studies have found that older people tend to be more socially cohesive than young people (Chen et al., 2015; Cramm & Nieboer, 2015; Van Dijk, 2006; Cramm & Nieboer, 2013; Yu et al., 2019). For instance, a study by (Alhasan et al., 2020) found that the older generation tends to reside in a neighbourhood with higher social cohesion than younger people. Thus, they are more socially cohesive than the younger generation. A study by (Yi, 2016) and (Wickes et al., 2014) confirmed this; contrary, a study by (Sturgis et al., 2014) perceived that social cohesion decreases with age in London.

In the study, the population group was found to influence social cohesion. In the South African context and per Stats SA (2022), race/ethnic group is called the population group. Several studies have shown that race and location are important in social cohesion (Meer & Tolsma, 2014). Some studies suggest a negative relationship between social cohesion and population group. Alhasan et al. (2020) found that race played a role in neighbourhood social cohesion; they found that blacks and Hispanics tended to live in neighbourhoods with low social cohesion compared to whites who lived in neighbourhoods with high social cohesion. This implies that neighbourhood location and socio-economic factors affect social cohesion. Sturgis et al. (2014) found that ethnic neighbourhood diversity significantly influences attaining social cohesion in London. This is consistent with the study's findings, which showed a positive correlation between social cohesion and population group (Laurence, 2011). They have found that ethnic diversity of the different groups significantly leads to lower socially cohesive communities. Gijsberts et al. (2012) found that ethnic minorities

scored lower on social cohesion than the majority. This may explain why attaining social cohesion has been a challenge in SA. The social and racial diversity of the country could be attributed to the lack of attainment of social cohesion in South Africa.

Women have higher levels of social cohesion than their male counterparts (Wickes et al., 2014). Valentova (2016) found that gender roles influence the attainment of social cohesion, and traditional gender attitudes result in less social cohesion. Contrary to this (Sturgis et al., 2014) found that women reported lower levels of social cohesion than their male counterparts. In the study, there is no relationship between social cohesion and gender; therefore, it can be deduced that gender does not affect the attainment of social cohesion. This is different to Segalo (2015), who posits that gender inequality in South Africa plays a role in attaining social cohesion—attaining social cohesion cannot be isolated from gender inequality (Valentova, 2016).

Economic activity level did not influence social cohesion in the study. The results are consistent with a study by (Dekker & Bolt, 2005), which did not find any significant relationship between social cohesion and economic activity and (Tolsma et al., 2009), which found a relationship between being economically deprived and social cohesion. On the contrary, a study by Yi et al. (2016) found that higher income levels were associated with higher social cohesion than lower income levels. In addition (Wickes et al., 2014) found that active employment status plays a role in social cohesion.

The current study established no relationship between education level and social cohesion. This is inconsistent with the results by Yi et al. (2016), which found that higher education levels are associated with higher social cohesion in the US. Wickes et al. (2014) also established in their study that Individuals with a higher level of education perceived higher levels of social cohesion than those with a high school education. Thus, there is a relationship between social cohesion and education, even though the study did not establish this relationship. The following socio-economic factors influence social cohesion: age, population group, and geographic location. Gender, economic activity and education level did not influence social cohesion. Given the country's history of racial and geographic segregation, it is interesting that the population group and geographic location influence social cohesion positively.

Socio-economic Factors and the first-level digital divide levels

The relationship between the first level, internet access, and socio-economic factors was assessed using logistic regression. The findings suggest that only two socio-economic factors influence internet access: education level and age group. The results are consistent with several studies examining differences between age and the digital divide (Abu-Shanab & Al-Jamal, 2015; Enoch & Soker, 2006; Wang et al., 2023). The results of the current study suggest that education levels are associated with more significant internet usage. Szeles (2018) found that tertiary educational attainment positively affects internet usage. The level of education positively and considerably influences individual user behaviour. Age was positively associated with internet access in the current study. These findings are consistent with what has been established in the literature (Abu-Shanab & Al-Jamal, 2015; Enoch & Soker, 2006). In their research, Tsetsi and Rains (2017) found that the younger generation tends to be internet-dependent compared to their older counterparts. However contrary to the findings by Fang et al. (2019 which did not find age as a determining factor in the digital divide.

Gender, economic status, population group and location did not influence internet access. This is inconsistent with what was found by (Kalmus et al., 2013; Mesch et al., 2013), who have suggested that women are more likely to be digitally less likely to access and use ITC products than their male counterparts. Abu-Shanab and Al-Jamal (2015) found that men in Jordan were not keen on allowing women to access the internet; this was also found among the most affluent people in Jordan. In another study, women who have adopted digital technologies were found to have increased labour participation (Viollaz & Winkler, 2021). A study conducted by Al-Saggaf et al. (2017) among Iranian women confirmed this; they found that internet access and use were more significant for unmarried women with no dependents than their married counterparts. They also found that levels of education and higher income in women increase the likelihood of weekly internet usage. In India, a study found that women were less likely to access the internet (Joshi et al., 2020). Broadband access is one of the key factors associated with the digital divide (Reddick et al., 2020). On the contrary, some studies find women more digitally empowered than men. Campos-Castillo

(2015) found that women were more likely to access the internet than their male counterparts. This is consistent with Haight et al. (2014), who found that women had more internet access than men. Tsetsi and Rains (2017) found no gender differences between men and women concerning internet access.

In the current study, population groups did not influence internet access. Some studies on the digital divide have shown correlations between ethnic minorities and the digital divide (Chakraborty & Bosman, 2005; Dupagne & Salwen, 2005; Mesch & Talmud, 2011). Tsetsi and Rains (2017) found differences between the white and minority responses concerning internet access. The poor ethnic minority tends to have lower mobile phone penetration and internet usage than most ethnic groups (Kaila, 2023). This further supports the idea that social and economic inequalities perpetuate the digital divide.

Geographic or spatial location was found not to affect internet access in the study. This differs from a study conducted in Nigeria (Adeleke, 2021), which established spatial disparity regarding intern access in Nigerian states. Literature suggests that those in urban areas are more inclined to adopt digital technologies than those in rural or remote areas. This is consistent in developed countries like America (Vogels, 2021; Perrin, 2019). Living in rural Malaysia impacted computer access and usage (Nair et al., 2010). Haight et al. (2014) found that rural and urban areas with internet access are the same. A recent study evaluating the differences between study access to ICT in SA found access differences between students living in urban and rural areas, favouring the latter (Lembani et al., 2020). The gap between those accessing the internet in rural vs urban areas is wide In Indonesia (Hadi, 2018). Hollman et al. (2021) found that the differences in internet connectivity in rural vs urban areas impact Nebrask''s internet access.

No relationship was found between economic activity and internet access. Low income is positively associated with non-access to a computer, internet and mobile phone (Várallyai et al., 2015). The probability that a high-income household has access to a computer and the internet is higher than that of a low-income household (Montagnier & Wirthmann, 2011; Chakraborty & Bosman, 2005; Kalmus et al., 2013). Low-income

households have less than 68% of low-income earners with a computer and internet access at home (Várallyai et al., 2015).

Socio-economic factors and the second-level digital divide

The results presented in section 4.7 suggest that internet usage is driven by population group, geographic location, educational level and economic activity. Education level was found to influence internet users in the study. This is consistent with what has been found by other authors. Szeles (2018) states that the level of education determines the adoption and use of technologies. Individuals with upper or higher educational levels are more likely to use technologies than those with just secondary education (Várallyai et al., 2015). A low level of education was found to play a significant role in perpetuating the digital divide in Indonesia (Hadi, 2018). On the contrary (Ahmed et al., 2015) did not find education level to play a significant role in access to the internet. In a study by (Lera-López et al., 2011) in Spain, internet usage was correlated with education.

In the current study, geographic location was associated with internet usage. This is consistent with Haight et al. (2014), who found significant use differences. Cruz-Jesus et al. (2018) found that the economic and educational disparities between countries and some aspects of geography are core drivers of the digital divide in those countries. Lai and Widmar (2021) found a negative correlation between internet speed and internet usage among those living in rural areas. In rural areas, most developing countries have low internet uptake and use (Hadi, 2018).

The current study has established a relationship between economic activity and internet use. The results are consistent with other studies that have explored the relationship between economic activity and internet use. A study found that the economic and educational disparities between countries and some aspects of geography are core drivers of the digital divide in those countries Cruz-Jesuset al. (2018). Higher-income earners are intensive internet users (Várallyai et al., 2015). Ahmed et al. (2015) found no significant association between age and internet usage.

Gender and age did not have any influence on internet usage. Gender has been previously found to influence internet usage in other studies. Gray et al. (2017) found significant gender differences between men and women concerning internet usage. Their findings are consistent with those (Abu-Shanab & Al-Jamal, 2015), who found that men were more likely to use the internet in Jordan than women. A study conducted in Latin America has further exacerbated disparities in women's internet usage compared to men. These findings mirror a study conducted in Jordan (Abu-Shanab & Al-Jamal, 2015). A comparative study in sub-Saharan Africa focused on six countries, namely Ghana, Kenya, Nigeria, Senegal, South Africa and Uganda, found gender differences on the internet; men were more likely to use the internet than women (Alozie & Akpan-Obong, 2017). Though the differences in some countries were not much, the frequency of internet use was not that significant between men and women among those who used it. This suggests that once women have access to and use the internet, the frequency of time is not that different from men. Mobile phone and smartphone ownership differences were noted in South Africa; women surpassed men in smartphone ownership, while men led smartphone ownership in the other five countries (Joshi et al., 2020).

Consistent with the results presented in the study, a study conducted among 28 EU countries found no gender differences between men and women in adopting and using digital technologies (Elena-Bucea et al., 2020) (Ahmed et al., 2015). A survey by Haight et al. (2014) established women had a higher percentage of internet access and online activities than men. On the contrary, men had a portion of SNS usage. This is significant to the study by (Cooper, 2006; Elena-Bucea et al., 2020), which showed gender differences in internet usage among men and women. Similar to gender, the results from the study suggest that age does not drive internet usage. Van Deursen and van Dijk (2019) found that younger people were more likely to use the internet than older people.

Socio-economic factors and the third-level digital divide

The results suggest that the following socio-economic factors influence benefits associated with being online: age, education and economic activities. Consistent with the study results, age research in the digital divide reveals that the younger generation

surpasses the older generation regarding online activities and skills (Helsper et al., 2016; Van Deursen et al., 2014). Most research on age disparities in the digital divide reveals that the younger generation surpasses the older generation regarding online activities and skills. Van Deursen and van Dijk (2019) found that younger people between 18 and 36 were more likely to use tablets than older people between 36 and 65. Haight et al. (2014) found that younger people had a more online presence regarding internet access, engagement in online activities and SNS usage than the older generation. Younger users were likelier to conduct social activities and socialise online (Tsetsi & Rains, 2017). Individuals earning high to average income are more likely to benefit from internet usage (van Deursen & van Dijk, 2014).

Some studies have established that less educated individuals use the internet for leisure rather than personal development compared to the more educated (van Deursen & van Dijk, 2014). Less-educated individuals are less likely to benefit and experience economic outcomes associated with being in line, such as e-commerce (van Deursen & van Dijk, 2014). Population group, gender, economic activity and geographic location did not influence the benefits of being online. Gray et al. (2017) found that gender played a role in one of the benefits of being online. Their study found that men in Latin countries were more likely to use social media than women. The population group strongly predicted the benefits associated with being online (Tsetsi & Rains, 2017). Shirazi (2012) found that ICT was a liberation and empowerment tool for Iranian women. This supports the notion of tangible outcomes associated with being online that women can gain immensely by being online beyond just social media usage. Viollaz and Winkler (2021) explored the relationship between internet access and labour participation outcomes of women in Jordan. Their findings suggest that women who use and have adopted digital technologies are more likely to have increased labour participation than those who do not, suggesting that education or social status did not influence women's access to and use of the internet. Haight et al. (2014) found that women had more online internet activities than men.

6.2.3 *Discussion in relation to RQ3*

The third research question was addressed through qualitative interviews, which constituted the qualitative phase of the study. The findings from these interviews are presented in chapter six of the thesis. Twelve participants were interviewed as part of this qualitative phase of the study. While the initial target for the number of participants was higher, the point of data saturation was reached earlier in the data collection process. Data saturation refers to the point at which new information or insights cease to emerge from the data, indicating that sufficient data has been gathered to address the research question adequately (Hennink et al., 2017; Mason, 2010; Morse, 1995; Saunders et al., 2018; Walker, 2012) often reached when interviews are not providing new information.

Given that data saturation was reached, the twelve participants provided rich and diverse perspectives that allowed for a comprehensive exploration of the research question. The qualitative findings offer valuable insights and an in-depth understanding of the phenomenon under investigation, shedding light on participants' views, experiences, and perceptions of the research topic. By reaching data saturation, the study ensures that the findings are robust in providing meaningful contributions to the research field.

Drivers of the digital divide

West (2015) argues that the following barriers drive the digital divide in developing countries: poverty, high devices, data, telecommunications charges, infrastructure, digital literacy challenges, and policy and operation. Similar drivers were identified in the study. The findings from qualitative interviews suggest that the following issues are instrumental in driving the digital divide in South Africa: infrastructure, affordability, and electricity. Most participants cited the infrastructure as an issue and one of the reasons the digital divide persists. The issue of infrastructure remains a challenge to most developed countries. Most studies show that infrastructure issues significantly perpetuate the digital divide in most developing countries (Shenglin et al., 2017; Umezuruike et al., 2015; Pick et al., 2021). Fuchs and Horak (2008) coined the term “digital apartheid” to illustrate the status of developing countries regarding the

resources needed to address the digital divide. Further supporting the lack of legacy infrastructure in developing countries perpetuates the digital divide in those countries.

While the infrastructure issue only addresses the access level of the digital divide (Hudson, 2005) argues that investment in the infrastructure can address the access digital divide. The issue of access also included the issue of mobile network providers, and some participants have expressed that the network is still an issue, especially in remote and rural areas. These are areas outside the city centre and tend to have little resources. In their study on internet access in rural areas, the same sentiment was shared by (Hadi, 2018; Hollman et al., 2021; Martínez-Domínguez & Mora-Rivera, 2020). In most countries, the network infrastructure is underutilised due to over-provision and user traffic (Sathiaseelan et al.,2015). High costs associated with digital infrastructure hinder the reduction associated with internet access. West (2015) posits that “weak infrastructure is a major barrier to digital access. This includes fibre optic lines, cell towers, Internet routers, wireless spectrum, reliable electricity, and the like” (p.3).

Furthermore, Kaila (2023) found that phone infrastructure tends to favour urban rather than rural and remote areas, impacting how individuals adopt and use the internet in Vietnam. Similarly, the participants cited the issue of unstable electricity and lack of spectrum as the drivers of the digital divide. A cross-country study in sub-Saharan Africa found that internet use was strongly associated with an electricity connection (Magida, 2022). This further supports the earlier point about the influence of electricity on the digital divide.

In South Africa, the digital divide is synonymous with the affordability of the data. The participants expressed that the exorbitant amount of data drives the digital divide. Data affordability has been in the spotlight and discussion led by media and politicians in the past three years. Sathiaseelan et al. (2015) argued that the exorbitant data prices in most countries are driven by operators’ unwillingness to carry on the additional operational costs associated with reduced data cost plans. A study conducted in Uganda showed how prices associated with data or broadband impacted the uptake and use of the Internet (Grossman et al., 2014).

Similarly, their review (Martínez-Domínguez & Mora-Rivera, 2020; Umezuruike et al., 2015) found that affordability of data and broadband was among the factors that led to a lack of internet penetration in Nigeria and Mexico. The data and broadband access issue has become prominent, and some participants expressed that it has become necessary. Some participants have expressed that one debate is whether they need bread or data; data for internet access has become the new currency and need. The study established the affordability of computers and Internet access as a driver of the digital divide (Tayo et al.,2016). As a result, higher academic institutions and telecommunication partnerships saw a move to offer data to university students and zero rates by other companies. It is important to note that even though the data was offered to some students, this only addresses the access divide and not the user and tangible outcomes of the digital divide. Reducing data prices and making internet access affordable only address one aspect of the digital divide.

ICT affordability has also been found to be strongly associated with income. Ali et al. (2019) found that in Australia, income was associated with internet affordability; low-income households could not access ICT as higher-income households due to affordability. This finding resonates with what was shared by the participants that internet access has become a need, with many households in SA living below the poverty line (Meyer & Nishimwe-Niyimbanira, 2016; Reyers, 2019). The relationship between ICT and poverty has been established elsewhere in the role of ICT in curbing poverty (Yilmaz & Koyuncu, 2018). Given the poverty levels in SA, one of the critical ways of addressing the social issue is enabling Internet access to all. There will be equity in the access to the Internet for all South Africans, and it will not be limited to only households with higher income or those living above the poverty line.

South Africa is currently experiencing load-shedding due to the low electricity supply. According to the participants from the study, this is a major driver of access to ICT. They argue that load-shedding affects the household electricity supply and the network providers' infrastructure, which impacts internet access. The study's findings are consistent with the study by (Armey & Hosman, 2016), who found that lack or distribution of electricity supply in low-income countries leads to lower ICT uptake and

usage levels (Armey & Hosman, 2016). Similarly, Adeleke (2021) also found access to electricity as a major driver for internet usage in Nigeria and other African countries (Magida, 2022). Contrarily, higher ICT usage is associated with higher electricity consumption in emerging countries (Afzal & Gow, 2016; Sadorsky, 2012; Saidi, 2017; Salahuddin, 2016). Kouton (2019), in his assessment of 11 African countries, found that although the effect of ICY on energy demand was established, it was not statistically significant. Suggesting that the relationship between internet access and usage and energy consumption may be context specific. Thus, in a country like South Africa, which is facing energy crises, this further impacts the access and usage of ICT.

Some participants mentioned the issue of literacy as another driver of the digital divide. Although most people may have access to ICT devices, they often use them for irrelevant things or only for social media instead of other meaningful activities such as studying or learning about small businesses. The issue of digital literacy is one of the areas which are investigated in the literature. A study by (Olsson et al., 2019) found a generational effect of ICT literacy. Compared to the younger generation, the older generation's access to and literacy ICT is low. Furthermore, it has been found that digital literacy impacts individuals' employment prospects. A study Wang et al. (2023) found that a lack of digital literacy skills and abilities affected individuals' prospects for searching for employment opportunities in China.

Bridging the digital divide

The participants did not end by highlighting what they thought were the drivers of the digital divide; they also suggested ways in which the issue of the digital divide can be tackled to address the drivers mentioned above. They have proposed that reducing the data costs is key; in fact, they even argued for universal internet access for all households. Secondly, the infrastructure issue at the macro level, through the infrastructure and micro-level access to ICT devices, is important in bridging the digital divide. Thirdly, the need for massive policy reform is key in enabling equity regarding internet access, ensuring there is no injustice with the pricing by the network operators and, finally, improving literacy levels and access to information.

The participants in the study have cited the reduction of data costs as one of the ways the digital divide can be bridged. As mentioned in the earlier sessions, the issue of affordability is one of the drivers of the digital divide. Therefore, reducing the data cost can undoubtedly lead to increased internet penetration and usage. Although there have been calls for mobile data reduction, data is still expensive in South Africa. According to the recent ICASA (2023) report, prepaid data prices ranged from R15-R20 for 100 (MB) to R599-R699 for 20480 (MB), while that for post-prepaid was R40-R89 for 1 (GB) to R2099 for 200 (GB). This further highlights a huge discrepancy in the costs associated with Internet access.

Furthermore, a large population of South Africans is unemployed, making it difficult to get cheaper plans through post-paid plans, which are only available to those who can provide evidence of fixed-term employment. This further shows the intersectionality between unemployment and internet access. Gong (2020) argues that when looking at the cost associated with the internet, it is important to look at pricing relative to income to bridge the affordability gap. Promoting affordable data plans and packages can make internet access more accessible and inclusive, particularly for individuals with limited financial means. By addressing the affordability aspect, more people can benefit from the advantages of being connected, narrowing the digital divide and promoting digital inclusion. Policymakers, regulatory bodies, and service providers must consider the participants' perspectives on reducing data costs as a significant step towards bridging the digital divide. By taking concrete actions to make data more affordable, societies can move closer to achieving a more equitable digital landscape that benefits all individuals.

The participants emphasised the importance of ICT infrastructure in addressing the digital divide, particularly in South Africa. They highlighted concerns related to the availability of spectrum, which impacts digital inclusion. Additionally, the participants identified infrastructure inequality as a significant factor driving the digital divide, specifically in rural and urban areas in South Africa. It is worth noting that this issue is common in South Africa but is also prevalent in many other developing countries, where the lack of infrastructure poses a significant challenge to achieving increased digital inclusion. Umezuruike et al. (2015) found that infrastructure was one of Nigeria's

leading causes of the lack of broadband access. Similarly (Martínez-Domínguez & Mora-Rivera, 2020) found that material access to ICT is important in mitigating the digital divide. Infrastructure challenges such as internet service availability have been found to play a key role in bridging the digital divide in Indonesia (Hadi, 2018).

The participants argued that a lack of political will and reform was among the inhibitors of digital inclusion in South Africa—the lack of government intentionality and willingness to address some digital divide issues. West (2015) also argues that a lack of clear policy could constrain realising digital inclusion in developing countries. The literature has established that regulatory reform and policies significantly bridge or address the digital divide. A study conducted in Mexico showed that enabling ICT regulations facilitated bridging the digital divide by 57% (Ovando et al., 2018). Some argue that the government should undertake policy reforms that ensure that communities that rely on mobile as their only gateway to the Internet do not get left further behind as a result of the leapfrog effect that has enabled ICT penetration (Chapin & Lehr, 2011; Napoli & Obar, 2013). Jamil (2021) found that the lack of supportive regulation and policies of digital technologies plays a role in further perpetuating the digital divide in Pakistan. Corrigan (2020) argues a greater need to intensify ICT policy reform and capacity to foster more digital inclusion in the African continent.

The findings from the study suggest that literacy levels and access to information could bridge the digital divide. A study in Kenya found that misinformation about social media was one of the critical barriers to women using and adopting digital technologies (Brännström, 2012). The participants in Nigeria cited the need to train on computer use and the Internet to bridge the digital divide (Tayo et al., 2016). A study in Kenya found that community technology centres play a role in bridging the digital divide and digital literacy (Wamuyu, 2017). Some participants mentioned that they observed how Wi-Fi enabled at community centres and schools are used for social media and other things; this could be attributed to the lack of digital skills and savviness.

Benefits of being online

The participants have expressed that there are different benefits associated with being online. They have cited convenience as one of the benefits of being online. The benefits cited include flexibility, as one participant cited that being online allows them to do things at their fingertips in their home. The findings are consistent with (Tayo et al., 2016) in their study, participants cited that the Internet enabled them to search for jobs and to network with others on social media platforms. This is consistent with the literature on the benefits of being online. Some participants have shared how they could continue to live normal lives during the hard lockdown. Some cited that they could also access health information and keep abreast with what was happening, consistent with the studies exploring the benefits of being online (Manganello et al., 2017). Estacio et al. (2019) found an association between the digital divide and access to health information. One participant mentioned that during COVID, access to health information was only limited to those online. Exploring information on the internet was one of the themes found in the study by (Tayo et al., 2016) in Nigeria, further cementing access to information as one of the benefits of being online.

The Intersectionality between the digital divide and Covid-19

Esteban-Navarro et al. (2020) found that COVID-19 exposed the rural digital divide in many European countries and America (Perrin, 2019; Vogels, 2021). The digital divide perpetuated the inequalities concerning access to ICT. Similarly (Aziz et al., 2020) posit that COVID-19 in Bangladesh was significant in exposing the digital divide, social stigma and social crisis. A study by (Azubuike et al., 2021) found that COVID-19 exposed the differences concerning access to online education. Other differences were noted between public and private school learners concerning access to digital tools and online studying. Watts (2020) highlighted the impact COVID-19 had concerning access to online information during the hard lockdown. Outpatient consultations were only available to those with the means and access to technology and the Internet. These studies demonstrate how the COVID-19 pandemic has accentuated inequalities in access to technology, ICT, online education, and information in Europe, America, and Bangladesh. The digital divide has significantly perpetuated these disparities during the pandemic.

Rainbow Nation a Myth or Reality

Most of the participants have expressed that the idea of the rainbow nation does not seem like it is attainable. Although the government has tried to create a rainbow nation over the years, they believe it is a myth and not attainable. One of the participants shared that it is a unicorn. They believe that the concept of a rainbow nation needs to be more superficial; one of the participants mentioned that if the rainbow nation existed, we would not have some people calling for an independent republic in one of the provinces. They believe the rainbow nation concept was a dream sold with no action plan. This is consistent with what has been captured in the literature (Lefko-Everett et al., 2018). Sall (2018) argues that more has stayed the same in moving towards Mandela's initially conceived dream of the rainbow nation. The participants agreed that it is a myth or, as one participant noted, a unicorn. The participants in the study viewed the rainbow nation as an enabler of social cohesion. This is consistent with the findings by (Lefko-Everett et al., 2018).

Drivers of Social Cohesion

Most participants hold the same view regarding social cohesion. They view it as something reasonable but not attainable. They argue that, as a country, there is a need for citizens to be more cohesive. Social cohesion only comes into existence when there are soccer events and matches. The participants had different views about the rainbow nation in the South African context. They have argued that it is a myth and a deferred dream (Gevisser, 2013). Another participant expressed that it was like a unicorn, which cannot be fully attained due to some of the societal issues present in South Africa. The findings suggest a lack of trust in the government, a significant measure of social cohesion. A recent study by Aasland et al. (2022), based on a Ukrainian sample, found a need for more trust in social institutions and public figures. Overall, the findings indicate a prevalent scepticism and need for more trust among participants regarding social cohesion in the country discussed. They perceive social cohesion as an ideal that has yet to be realized due to societal issues, a lack of trust in the government, and a temporary nature limited to specific events.

Barriers to the Attainment of social cohesion

The participants have identified several barriers to attaining social cohesion in South Africa, including education, unemployment, socio-economic landscape, diversity and inclusion and levels of inequality. Education is seen as a barrier to social cohesion. The quality of education and access to educational opportunities can significantly impact social integration and equal opportunities for all members of society. The high levels of unemployment in South Africa are considered a barrier to social cohesion. Lack of employment opportunities can lead to social exclusion, inequality, and feelings of marginalisation among certain social groups. The socio-economic landscape of South Africa, characterised by significant disparities in wealth, resources, and opportunities, is seen as a hindrance to social cohesion. These inequalities can create divisions and contribute to social fragmentation. South Africa's diversity, while a source of richness, can also present challenges to social cohesion. Differences in culture, language, and identity can sometimes impede the development of shared values, common goals, and collective identity. South Africa's status as one of the most unequal countries globally significantly affects social cohesion. High levels of inequality can erode trust, exacerbate divisions, and hinder social integration and harmony efforts. David et al. (2018) suggest that their study found a correlation between rising inequality and decreased levels of social cohesion in South Africa. This finding aligns with the participants' concerns about the impact of inequality on social cohesion. The participants highlighted education, unemployment, the socio-economic landscape, diversity, and inequality as barriers to achieving social cohesion in South Africa. These factors contribute to fragmentation, marginalisation, and mistrust within society.

Perceived Impact of covid-19 on Social Cohesion

COVID-19 has impacted the different societal issues and themes that have emerged in the qualitative arm of the study. The participants were split concerning the impact of covid 19 on social cohesion. Some suggest that it has enabled and facilitated social cohesion. They felt that more people started to be socially cohesive to assist others when the pandemic started—the themes in the qualitative phase of the study's analysis of COVID-19 impact various societal challenges. Concerning the effect of COVID-19 on social cohesion, the participants were divided. Some even contend that

it has helped promote and encourage social cohesion. In a way, they perceived a rise in social cohesion due to the pandemic, which enabled more people to help one another. This is consistent with the findings by (Stevenson et al., 2021) that the Covid -19 promoted social cohesion among neighbours in the UK. Contrary (Borkowska & Laurence, 2021) found that covid 19 negatively influenced social cohesion, and the levels of social cohesion decreased compared to the previous years. In a way, they perceived a rise in social cohesion due to the pandemic, which enabled more people to help one another.

6.3 Reviewing the study hypotheses

H01: There is a relationship between the digital divide and social cohesion.

The first hypothesis tested the relationship between the digital divide and social cohesion as the outcome variables. SEM was applied, which led to five factors of the digital divide. The Results from the study suggest that Information search is highly correlated with social cohesion (rho =0.343), followed by leisure and fun (.103). The variable which was highly correlated with social cohesion was information search (rho =0.343). However, the highest correlation among all the variables is between social activities, belonging, and business/career progression (rho = 0.501). The least correlation was found between business/career progression and social cohesion (rho = 0.018), followed by religious activities and social cohesion (rho=0.019). Wallace et al. (2017) studied social cohesion and interaction with ICT in rural communities. Their research found that ICT can be used to bridge social divisions and thus foster social cohesion.

H02: There is a relationship between socio-economic factors and social cohesion.

The second hypothesis investigated a relationship between socio-economic factors and social cohesion. The following socio-economic factors were significantly associated with social cohesion: age group (p<.000), geographic location (p<.000), and population group (p<.000). No positive and significant relationship was found

between social cohesion and gender (p<.078), educational level (p<.168) and economic activity (p<.321).

H03: There is a relationship between socio-economic factors and the three levels of the digital divide.

The last hypothesis is a relationship between socio-economic factors and three levels of the digital divide.

- **$H_0$3a: There is a relationship between the socio-economic factors and internet access (first-level digital divide).**

The following relationship was established between internet access and socio-economic factors. A positive relationship between internet access and age group (P<.000) and education level (P<.000). No relationship was found between internet access and economic activity (p<.179), geographic location (p<.016), population group (p<.717) and gender (p<.204).

- **$H_0$3b: There is a relationship between socio-economic factors and internet usage (second-level digital divide).**

The second level of the digital divide was assessed using internet usage. There is a positive relationship between the second internet usage and population group (P<.000), geographic location (P<.000), education level (P<.000) and economic activity (P<.001). No statistically significant relation was found between internet usage and age (p<.325) and gender (p<.178).

- **$H_0$3c There is a relationship between the socio-economic factors and benefits of being online (third-level digital divide).**

Finally, a relationship between the benefits of being online and socio-economic factors was examined. The results found a positive relationship between the third-level digital divide and age (p<.000), educational level (p<.000) and economic activity (p<.001). No relationship was found between the third-level digital divide and population group (<.010), gender (p<.565) and geographic location (p<.191). These results suggest that

information search, leisure and fun, social activities, belonging, and business/career progression positively correlate with social cohesion. Socio-economic factors such as age group, geographic location, and population group are significantly associated with social cohesion. At the same time, gender, educational level, and economic activity do not show a significant relationship. Various socio-economic factors influence Internet access, internet usage, and the benefits of being online. Overall, the results emphasise the role of digital access and socio-economic factors in shaping social cohesion and the digital divide.

6.4 Application findings/results to the theoretical frameworks

The study used ecological systems theory to understand the complexity of the digital divide and social cohesion, specifically focusing on the ecological systems theory. In addition, the socioeconomic drivers of both the digital divide and social cohesion were explored using resources appropriation theory for the digital divide and relational cohesion theory for social cohesion. As stated in Chapter 2, the focus of the study was on the mesosystem and how its interconnections with other systems affected the attainment of social cohesion or further perpetuated the digital divide.

6.4.1 *Ecological Systems theory*

Systems theory was used in the study to understand the relationship between social cohesion and the digital divide. In Chapter Two, it was argued that social cohesion and the digital divide are social systems that are interconnected and could affect each other. It was further argued that as both social systems, the digital divide and social cohesion influence each other. The study's results suggest that a relationship between social cohesion and the digital divide exists. At the micro level, which focuses on individual experiences and interactions, quantitative and qualitative data collection methods were employed to understand the relationship between social cohesion and the digital divide and their drivers. Qualitative data collection aimed to capture rich, detailed information about individual's experiences with the digital divide, social cohesion, and socio-economic factors. The qualitative data collected at this level provided insights into individual perspectives, motivations, and lived experiences.

The macro level considers broader societal or systemic factors influencing social cohesion and the digital divide. Qualitative interviews provided more insights into the digital divide and social cohesion by looking at the macro-level factors that play a role in their perpetuation. For instance, in the interviews, the issues of infrastructure, policy, unemployment, and inequality emerged prominently as issues that drive the digital divide. The same was observed with social cohesion. The participant emphasised that the role or lack of the government in ensuring social cohesion is not just an exercise ticking box but rather is addressed and implemented.

6.4.2 *Resources appropriation theory*

The resources appropriation theory was applied in the study; the study deductively assessed the personal and positional categories of the digital divide, access to ICT and benefits. The resources emerged from the qualitative findings collected from the interviews. The study applied the resources appropriation theory to analyse the digital divide, specifically focusing on the personal and positional categories of the divide, as well as access to information and communication technologies (ICT) and associated benefits. This theory emphasises the distribution and allocation of resources within society and how they can create inequalities and disparities. In the study, the researcher deductively assessed the personal and positional categories of the digital divide. The personal category refers to individual-level characteristics influencing ICT access and usage, such as age and gender. Conversely, the positional category pertains to structural factors such as geographic education level, economic activity location and population group that can affect digital access and use.

The study employed quantitative and qualitative data collection methods to explore these categories and gain a deeper understanding of the digital divide. From the qualitative findings, the participants highlighted resources such as having access to the infrastructure and electricity driving the digital divide. In the study, the participants mentioned that disruptions in electricity influence the resource categories of the digital divide. A second resource highlighted was the affordability issue, driven by income and unemployment. The participants argued that internet access was expensive and led to many individuals being unable to buy data to access the internet. By applying

the resources appropriation theory and collecting qualitative data through interviews, the study explored the perceptions, perspectives, and challenges individuals face in accessing and using ICT. The findings provide insights into how resources are distributed, appropriated, and potentially contribute to or exacerbate the digital divide—using qualitative interviews allowed for a deeper understanding of the inequalities and disparities of ICT access and use.

According to the theory, the following inform the technological appropriation, attitude, material access, skills and usage. In the study, material access and usage were explored. Concerning material access, most respondents indicated that they had access to the internet (93.9%), and 94.9% expressed that they owned a smartphone. Only 6.1% and 4.4% indicated they did not have internet access or mobile phone ownership. Most respondents indicated that they use a mobile phone for internet access (71.9%), followed by those using a laptop or PC and iPad/tablet, 53.2% and 15.5%, respectively. This suggests that they had material access to ICT. Participation in society concerns how the resources, personal and positional characteristics and technology appropriation enable social participation. Participation in society was evident in both qualitative interviews and the results from the survey. The results from the survey suggest the following benefits associated with online information search: social activities and belonging, business/career progression, religious activities, leisure and fun. In the qualitative interviews, the participants mentioned convenience and socialising benefits.

6.4.3 *Social-categorisation theory*

The social-categorisation theory was used to operationalise social cohesion. According to SCT, people endeavour to achieve and maintain a positive social identity by identifying with certain groups and differentiating themselves from others. The results from the study suggest that individuals' identity or social categorisation is driven by the following factors: age affects social cohesion and individual social categorise. Geographic location link and how individual social categorises in the respective spatial location impact the attainment of social cohesion. Social categorisation by population group impact on the attainment of social cohesion.

6.5 Integrating quantitative and qualitative data

The study used qualitative and quantitative data collection methods, employing a concurrent mixed-method design. This design allows for the integration and triangulation of data from different sources, providing a comprehensive understanding of the research topic. The integration of qualitative and quantitative methods can be viewed through the lens of ecological systems theory, specifically considering the micro and macro systems. Integrating qualitative and quantitative data at each system level allows for a more comprehensive understanding of the relationship between social cohesion, the digital divide and their socio-economic drivers. Using a concurrent mixed-method design, researchers combined the depth and richness of qualitative data with the generalizability and statistical power of quantitative data. Triangulation of findings from multiple data sources enhances the validity and reliability of the study's conclusions, as the different methods provide complementary perspectives on the research questions.

The quantitative results showed the micro drivers of the digital divide, while the qualitative findings highlighted the micro and macro drivers. From the quantitative, Internet access highly correlates with age, education level, and gender. At the same time, internet use was highly correlated with population group, geographic location, education level and use, economic activity, and internet use. The quantitative results are consistent with what was shared by the participants during the interviews; they have cited that affordability is one of the drivers of the digital divide at the micro level. At the meso level, the participant's economic activity was strongly associated with internet use, suggesting that those with the means can afford to use the internet. Again, consistent with the qualitative interviews, participants highlighted the lack of literacy levels and shared that digital access enabled by Internet access allows them to be social and convenient, especially during the pandemic. The quantitative results also found a relationship between the benefits of being online and age, education level and economic activity.

Qualitative interviews highlighted the effect of the digital divide at the macro level. The participants shared that there is a need for policy reform and government will in addressing the digital divide issue. The participants also highlighted the infrastructure issue to enable digital access to all. The participants also highlighted electricity as a macro issue; in particular, they argued that load-shedding due to energy issues in South Africa contributes to the digital divide. One may have a resource, personal and positional access and the means to appropriate technology but still encounter connectivity issues due to load-shedding.

At the micro level, the quantitative data showed that social cohesion is strongly affected by age group, geographic location and population group. At the meso level, the participants shared that a lack of sustained effort towards social cohesion has made achieving social cohesion impossible. They have further argued that the triple threat of poverty and unemployment inequality at the macro level is fundamental in attaining social cohesion. Berger-Schmitt (2000) argues that poverty, unemployment and social exclusion contribute to attaining social cohesion. Corroborating the insights shared by the participants in the study and what was established in a study (Ngcaweni, 2016) citing high employment among the youth in South Africa correlated with low levels of social cohesion.

By integrating the qualitative and quantitative data collection methods, the study showed that the drivers of both the digital divide and social cohesion are not only at the micro or individual level but can be observed at the macro level. Therefore, measures to tackle them cannot be only at the micro or individual levels. In the table presented below, it is evident from the study that the micro drivers were addressed using both qualitative and quantitative data. In contrast, only the macro is prominent in the quantitative phase. This is attributed to the fact that the questions in the survey were biased towards the micro drivers. By nature, qualitative data collection enables the exploration of issues that have yet to be explored and allows for greater depth in understanding the issue. The data's micro and macro drivers emerged from the qualitative interviews. It is also important to note that the micro drivers from both qualitative and quantitative data varied. The latter focuses more on the socio-economic drivers. From qualitative data, the micro drivers included issues such as

affordability and literacy skills as drivers of the digital divide. At the same time, the macro drivers focus on policies, government regulation, role, and infrastructure. It should also be noted that infrastructure can be viewed at both micro and macro drivers. From the macro level, existing infrastructure such as hardware, fibre, and network infrastructure play a role in enabling digital inclusion. While at the micro level, access to the devices' infrastructure is critical in ensuring financial inclusion. There is a greater need to quantitatively explore the drivers of social cohesion and the digital divide at the macro level. Similarly, the same observation is evident in the assessment of social cohesion. The micro and macro drivers were present in the interviews and the survey.

Table 6-1 Integrating qualitative and quantitative data using ecological systems theory

	Digital divide		**Social cohesion**	
	Quantitative data	**Qualitative**	**Quantitative**	**Qualitative**
Micro	A positive relationship exists between the first-level digital divide and age (p<.000) and education level (p<.000). A positive relationship exists between the second-level digital divide and population group (P<.000), geographic location (p<.000), education level (p<.000) and economic activity (p<.001). There is a positive relationship between the third-level digital divide in the age group (p<.000), education level (p<.000), and economic activity (p<.001).	*If you think about someone who has a cell phone but does not have access to the internet, if I stay in the sixth -a pack, for example, didn't you know the western part of South Africa is not only an infrastructure challenge but also? Therefore, the ability to fight that is daily also a challenge* – **Participant 2** *"So that is why affordability is such a big component because I understand the inequalities of this country, and that understands that a lot because usually people have access to these things.* - **Participant 2**	A positive relationship exists between age group and social cohesion (p<.000). There is no relationship between economic activity and social cohesion (p<.321). There is no relationship between educational level and social cohesion (p<.168). A positive relationship exists between geographic location and social cohesion (p<.000). A positive relationship exists between the	"And I look at there is a just a lot. There is no such thing as a rainbow nation. People are fake. We create flakiness. Furthermore, it is an illusion. Not being true or being themselves, the minute you become true to become yourself or your truest form – Participant 5 "Rainbow nation exists because you did not have some within our society who wanted to live under an independent republic inside Africa. If this thing

			population group and social cohesion (p<.000). There is no relationship between gender and social cohesion (p<.078).	was not for us. "– Participant 1
Macro		*The infrastructure, you know, we have got all the technology that we would access, you know, even those guys from Africa"* - **Participant 9** *The electricity and infrastructure aired in rural Eastern Cape or KwaZulu Natal. You do not get network from your Telco's."* - **Participant 3**		"Social cohesion is like a panacea where you hope people eventually get along. People eventually accept and. It is a norm that they are where they are socially, but we can all live together, and it is not a virtue. The other things do not exist, but we happily live with them. I think it is like a panacea. It is not an achievable thing. - **Participant 3**

CHAPTER 7. SUMMARY, CONCLUSION AND RECOMMENDATIONS

The chapter concludes the research study by presenting its findings and outcomes. It includes a statement that addresses the research questions initially introduced in Chapter One, which are restated below for clarity. Furthermore, the chapter highlights the study's contribution to the field of research and acknowledges any limitations encountered during the study.

Research question 1: *What is the relationship between the digital divide and social cohesion?*
Research question 2: *What socio-economic factors drive the digital divide and social cohesion?*
Research question 3: *What is the perceived influence/effect of the digital divide in attaining social cohesion?*

In addition to the conclusion and limitations, the chapter concludes with recommendations based on the research findings. These recommendations serve as suggestions for future studies, encouraging further exploration of the subject matter. By doing so, the study aims to stimulate and guide future researchers in expanding upon the current research and gaining deeper insights into the topic.

7.1.1 *Conclusion in relation to RQ1*

The study's results suggest a relationship between social cohesion and the digital divide. Suggesting that the digital divide influences or impacts the attainment of social cohesion. Therefore, it can be deduced that the digital divide potentially impacts attaining social cohesion. The Results from the study suggest that information search is highly correlated with social cohesion, followed by leisure and fun. The variable which was highly correlated with social cohesion was information search. However, the highest correlation among all the variables is

between social activities, belonging, and business/career progression. The least correlation was found between business/career progression and social cohesion, followed by religious activities and social cohesion. They suggest that social cohesion is highly correlated with information search and leisure rather than not so much with belonging and business/career progression.

7.1.2 *Conclusion in relation to RQ2*

The second research question employed the relationship between socio-economic factors and the two constructs by investigating a relationship between social cohesion and the digital divide and socio-economic factors. The following socio-economic factors were significantly associated with social cohesion: age group, geographic location and population group. No positive relationship was found between social cohesion and gender, educational level, and economic activity. This suggests that socio-economic factors are potential social cohesion, age, geographic location, and population group drivers.

The second part of the second research question investigated the relationship between socio-economic factors and three levels of the digital divide—a positive relationship between internet access, age group, and education level. No relationship was found between internet access and economic activity, geographic location, population group and gender. It can be deduced that internet access is influenced by age group and education level among the population studied. The second level of the digital divide was assessed using internet usage. The results show a positive relationship between the second internet usage and population group, geographic location, education level and economic activity. No statistically significant relationship was found between internet usage, age, and gender. It can be deduced that internet usage, or the second level of the digital divide, is driven by population group, geographic location, education level and economic activity and not age and gender in the population studied.

Finally, a relationship between the benefits associated with being online and socio-economic factors was examined. The results found a positive relationship

between the third-level digital divide and age, educational level, and economic activity. No relationship was found between the third-level digital divide, population group, gender, and geographic location. The following socio-economic factors drive the benefits of being online: age, educational level, and economic activity.

7.1.3 *Conclusion in relation to RQ3*

The last and final research question was explored through qualitative means. The findings suggest that affordability, infrastructure, electricity and literacy drive the digital divide and the socio-economic factors presented in the previous section. Also, the data costs, creating more access to the infrastructure, including spectrum availability, policy reform, and increasing literacy levels and access to information, can assist in bridging the digital divide. The participants have also mentioned convenience and flexibility as some of the benefits associated with being online. The participants believe that the concept of social cohesion or a rainbow nation is an empty promise that the government committed to changing the new society -post-1994. Some participants' challenges to attaining social cohesion are unemployment, inequality, and poverty. Finally, the participants believed that COVID-19 had perpetuated the digital divide. Covid-19 has also made it even more difficult for the country to be socially cohesive.

7.2 Contribution

7.2.1 *Empirical contribution*

The study has made an empirical contribution in three ways. The first is understanding the relationship between social cohesion and the digital divide in a developing country. The issue of social cohesion is important in ensuring unity in South Africa. Since the onset of democracy in 1994, the government has been vocal in preaching the gospel of unity through social cohesion. As part of the study, the contribution is on how digital inclusion can be used to build a cohesive South Africa. The second contribution is understanding the drivers of social

cohesion and the digital divide in South Africa. While the issue of social cohesion has been widely studied and written about, there needs to be more understanding of socio-economic factors' role in driving social cohesion. The study found that population group, sometimes used interchangeably with race, is one of the drivers of social cohesion. Although this is not a surprising finding given the country's socio-political landscape, it is an important one that may highlight some racial issues.

The third contribution of the study is understanding the benefits of being online. Based on the CFA, five factors were observed: business/career, leisure/fun/religious activities, information search and social activities/belonging. This is different from what has been found in other studies. However, it highlights the need to look at the contextual issues when looking at the digital divide. The study also contributed to understanding some of the socio-economic drivers of the three levels of the digital divide. The first level, as presented in the earlier sections of the document, is concerned with internet access. At the same time, some literature and data suggest that internet penetration has increased, but other factors still drive it. If they are left unattended, the first level of the digital divide will persist. The study's results established that age and education level affect internet access. This is consistent with the data in other parts of the world, which shows that younger generations are more likely to access the internet, unlike the older generation. The level of education also positively contributed to internet access, while no relationship was found between gender, population group, economic activity and geographic location.

The study shows that age and gender do not affect internet usage. The results did find a significant relationship between internet usage and population group, geographic location, education level and economic activity. Again, these are deeply entrenched in the country's societal issues, such as unemployment, which affects the economic activities of individuals and the affordability of buying data to access the internet. Geographic location affected internet usage because the resources are often channelled to more suburban areas; for example, it was not until recently that fibre was installed in townships. At the same time, there have

been some developments in the installation of fibre, and the costs associated with uncapped internet remain a constraint. Network connectivity remains an issue in some areas, as cited in the qualitative interviews. In some rural areas, connectivity remains a challenge. An individual might have access to the devices that enable them to connect to the internet but can be limited by the network service in the area. The results also suggest that education level, economic activity and age play a significant role in the benefits of being online.

Table 7-1 Socio-economic factors driving social cohesion and the digital divide

Construct	**Factors**
Social cohesion	Population group, geographical location and age
First level digital divide	Age, geographical location and education level
Second-level digital divide	Population group, geographic location, education level and economic activity
Third-level digital divide	Age, education level and economic activity

7.2.2 *Methodological contribution*

The research conducted in this study has provided a methodological advancement in comprehending two key concepts: social cohesion and the digital divide. Existing literature, as presented in chapter two, has predominantly focused on quantitative approaches when exploring these constructs. However, only some studies utilised qualitative data collection methods and a scarcity of mixed-methods research. In this regard, the current study has made a significant methodological contribution by adopting a mixed-methods approach for data collection. By incorporating qualitative and quantitative methods, a more comprehensive understanding of the factors influencing the digital divide and social cohesion has been achieved. The qualitative component has allowed for a nuanced exploration of these concepts, while the study's quantitative arm has examined the socio-economic factors at play. The study, utilising a mixed-methods approach, has enhanced the methodological landscape surrounding the investigation of social cohesion and the digital divide. It has provided a more

holistic and in-depth perspective on these phenomena, contributing to a broader understanding of their complexities and interconnections.

7.2.3 *Practical and novelty contribution*

Previous research has examined the digital divide and its impact on social cohesion, but no studies have investigated the constructs together. This study aimed to contribute practically by examining the potential effects of the digital divide on social cohesion in South Africa. Social cohesion is an ongoing debate and concern in new democratic societies. The digital divide continues to be an essential issue, exacerbating existing social inequalities and hindering social cohesion. This paper proposes an innovative and practical approach to addressing the digital divide, emphasizing the interplay between digital access, social cohesion, and socioeconomic factors. The proposed approach aims to foster inclusive digital environments that bridge disparities and enhance social harmony by integrating novel strategies into existing frameworks.

The digital revolution has significantly transformed social interactions, education, and economic participation, but the persistent digital divide threatens to deepen existing social fractures. This paper explores a multifaceted approach considering socioeconomic factors as key elements in mitigating the digital divide and fostering social cohesion. Implementing this approach requires collaboration from governments, private sector entities, and civil society to create a more inclusive and connected digital society. This paper proposes a practical and novel approach to addressing the digital divide and enhancing social cohesion by combining technological innovations with targeted socioeconomic interventions. The proposed approach seeks to create a more connected and inclusive digital society by considering the interplay between digital access, social cohesion, and socioeconomic factors.

7.3 Limitations of the study

Several limitations have been identified and will be addressed in this study, including the impact of Covid-19 regulations, contextual factors, the timing of the study, data collection periods, and challenges associated with paper-based surveys and access communities.

- **Impact of Covid-19 Lockdown Regulations:** The study's fieldwork was impacted by the Covid-19 lockdown regulations, resulting in delays and rescheduling data collection activities. This affected the study timelines and pushed the fieldwork to a later period in 2021. The restrictions imposed during the pandemic indirectly influenced the digital divide and social cohesion as people rapidly adopted digital technologies for online education, remote work, and socialisation. This context may have influenced the participants' understanding and experiences of these concepts.
- **Contextual and Timing Limitations:** Conducting the study during the Covid-19 pandemic, when the digital divide and inequality were in the spotlight, introduced additional complexities. The widespread adoption of digital technologies and reliance on the internet for various activities may have influenced participants' perspectives on the digital divide and social cohesion. The pandemic-related circumstances created a unique backdrop that may have influenced participants' attitudes and behaviours related to technology usage.
- **Extended Data Collection Period:** The data collection process took longer than initially anticipated due to multiple lockdown periods and restrictions. Fieldwork was only possible when the country was on a lower lockdown level, limiting access to participants and extending the data collection timelines. While the online data collection phase was feasible, it had limitations, especially the qualitative data collection conducted using MS Teams. The challenges related to electricity availability and load shedding in certain areas impacted the data collection for this study phase. These power failures disrupted interviews and required rescheduling, impacting the data collection process.

- **The use of paper base surveys:** The paper-based survey employed in the study had several limitations, particularly regarding the location and access to selected areas. The survey aimed to capture data on the digital divide and social cohesion among the digitally excluded population, which led to the selection of informal settlements as the survey locations.
- **Access to communities and remote areas**: Accessing any community as an outsider, especially informal settlements, presents challenges. T to address this issue. Relatives or friends of relatives were identified as contacts who could facilitate access to the respondents. This approach not only helped in gaining entry to the communities but also ensured the safety of the researcher, who is a female. It is noted that in South Africa, women may face safety concerns in certain communities, and the presence of a male relative provided a level of security for the researcher during interactions with respondents.
- **Method Bias:** The researcher employed a mixed method approach to minimize the potential methodological bias inherent in each individual method. The integration of both qualitative and quantitative methods enabled the investigation to address some of the limitations of each approach. The utilization of a mixed method enabled the researchers to validate the results obtained in the study, which is not possible when a single method is used exclusively.

However, these measures also introduced potential biases and limitations in the survey. Relying on personal connections within the communities may have led to a non-random sample, potentially affecting the representativeness of the data collected. The selection of specific locations, such as informal settlements, may have influenced the respondents' characteristics and perspectives, limiting the findings' generalizability to other populations or contexts. These limitations should be considered when interpreting and generalising the study's findings to other contexts. They highlight the challenges faced due to external factors and the need for flexibility in research design and implementation during unprecedented circumstances like a pandemic.

7.4 Recommendations and Implications

This section will provide a range of technical, policy, and practical recommendations. The recommendations presented here aim to address various aspects of the digital divide and social cohesion and offer actionable steps for improvement.

7.4.1 *Policy recommendations*

There is an urgent need for policy reform to address access to data in our increasingly digital world. Internet access has become vital for various activities comparable to basic needs like food. Therefore, governments must prioritise internet access and consider it a universal requirement. Although there has been an increase in the number of people with internet access, a significant portion of South Africa's population still lives below the poverty line. To bridge the digital divide and ensure equitable access to opportunities, the government must proactively provide its citizens with affordable and accessible data services.

Policy reforms should focus on the affordability of data services, which can be a significant barrier for individuals and households with limited financial resources. The government can establish initiatives that promote affordable data plans and ensure that data costs are reasonable and proportional to people's income levels. Additionally, efforts should be made to enhance internet infrastructure and connectivity in underserved areas, including rural and marginalised communities. By investing in expanding network coverage and improving the quality of internet services, the government can facilitate broader access to data for all citizens, regardless of their geographical location.

In today's digital society, access to data has become a fundamental requirement for participation. Given the persistent challenges of poverty and inequality, it is crucial for the government to prioritise and reform policies that ensure affordable and widespread access to data services. By doing so, they can promote inclusivity, empower individuals, and enable equal opportunities for all citizens.

The issue of infrastructure, particularly in rural and remote areas, has been a long-standing concern that requires urgent attention from the government. Despite being on the government's agenda for years, progress in ensuring its implementation must be accelerated. This issue was prominently highlighted in the qualitative interviews conducted for the study. Access to adequate infrastructure in rural and remote areas poses a significant challenge in bridging the digital divide. Without proper infrastructure, extending reliable internet access to these underserved regions becomes difficult, exacerbating the inequality in access to digital resources and opportunities.

To address this issue, it is crucial for the government to actively support and collaborate with telecommunication companies to expand infrastructure in these areas. Public-private partnerships can play a vital role in this process, as they allow for shared resources, expertise, and funding to facilitate infrastructure development. Telecommunication companies should be encouraged and incentivised to invest in building the necessary infrastructure, such as network towers, broadband connections, and improved connectivity, to improve internet access in remote and rural areas. The government can provide incentives, tax breaks, or subsidies to telecommunication companies to encourage them to prioritise infrastructure development in underserved regions. Moreover, it is important to consider innovative solutions, such as satellite internet or mobile data solutions, to reach areas where traditional infrastructure deployment may be challenging or costly. Exploring alternative technologies can help overcome the barriers posed by geographical limitations.

Addressing the infrastructure gap in rural and remote areas requires a collaborative effort between the government and telecommunication companies. By actively supporting infrastructure development and creating an enabling environment for investment, the government can help ensure improved access to the internet and bridge the digital divide for all citizens, regardless of their location.

7.4.2 *Technical recommendations*

Social cohesion has received significant attention from the government, as evidenced by speeches and national development initiatives. However, there is a need for more practical efforts to achieve social cohesion in the country effectively. More than acknowledging the importance of social cohesion is required; it requires concrete actions and implementation. In order to advance the agenda of social cohesion, it is essential to develop and refine the definition of social cohesion, aligning it with the country's values and specific context. A clear and comprehensive definition will guide policies, programs, and initiatives to foster social cohesion.

Moreover, it is crucial to move beyond rhetoric and ensure that the social cohesion agenda is properly articulated and translated into tangible actions. It should not be limited to a mere "talk shop" but rather supported by practical measures and strategies. This requires a commitment to implementation, with specific targets, timelines, and accountability mechanisms in place.

Engaging various stakeholders, including government agencies, civil society organisations, community leaders, and citizens, in a collaborative and participatory manner is important to facilitate effective implementation. Their input and involvement can help shape policies and initiatives that address the underlying factors contributing to social divisions and promote inclusivity, equality, and mutual respect. Additionally, monitoring and evaluation mechanisms should be established to assess the progress and impact of social cohesion initiatives. Regular assessment and feedback loops will enable course corrections, identify successful practices, and ensure that resources are allocated appropriately to initiatives that contribute to social cohesion. While social cohesion has been on the government's agenda, more concerted efforts are needed to make the vision a reality. This requires the further development of the definition of social cohesion, clear articulation of the agenda, and a focus on practical implementation. The government can foster a cohesive society based on shared values and inclusive practices by taking concrete actions and involving diverse stakeholders.

7.4.3 *Suggestions for further research*

The current study utilised a mixed-method design to delve into the digital divide and social cohesion from a public perspective. However, further qualitative research is necessary to understand policymakers' and government perspectives regarding the digital divide. Such insights can offer valuable inputs into policy formulation and implementation, paving the way for more effective strategies and interventions to bridge the digital divide. Moreover, while existing research on social cohesion exists, a more nuanced understanding of contextual factors driving social cohesion is essential. An in-depth exploration of these factors can offer valuable insights into the dynamics of social cohesion, enabling the creation of more targeted and effective interventions.

There is a need for theoretical exploration of social cohesion. While extensive empirical research has been conducted on social cohesion, developing a deeper theoretical understanding is necessary to comprehend the complexities and underlying mechanisms contributing to social cohesion. Researchers can guide future studies and inform practical interventions by developing comprehensive frameworks and models, laying a strong theoretical foundation. Addressing these research gaps through qualitative studies with policymakers and further theoretical exploration will enhance our understanding of the digital divide and social cohesion. It will enable the creation of context-specific strategies, policies, and interventions that can effectively address these issues and create a more inclusive and cohesive society.

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APPENDIX A Ethics Certificate

UNIVERSITY OF THE WITWATERSRAND JOHANNESBURG

Research Office

HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)
R14/49 Magida

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER: H21/03/12**
PROJECT TITLE	The nexus between the digital divide, income inequality and social cohesion in South Africa
INVESTIGATOR(S)	Ms A Magida
SCHOOL/DEPARTMENT	Wits Business School/
DATE CONSIDERED	19 March 2021
DECISION OF THE COMMITTEE	Approved Risk Level: Minimal
EXPIRY DATE	14 April 2024

DATE 15 April 2021 **CHAIRPERSON** _____
(Professor J Knight)

cc: Supervisor : Professor B Armstrong

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University. Unreported changes to the application may invalidate the clearance given by the HREC (Non-Medical)

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to submit an amendment of the protocol to the Committee. **I agree to completion of a regular progress report. For Minimal and Low studies, this is due annually on 31 December. For Medium and High Risk studies, this is due twice annually on 30 June and 31 December.**

A.MAGIDA
_____
Signature

15/ 04 /2021
Date

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES

APPENDIX B PIS Survey

Participant Information Sheet

Invitation to participate in a research study

Good day

My name is Ayanda Magida, and I am a PhD student at the Wits Business School at the University of the Witwatersrand, Johannesburg. As part of my studies, I have to undertake a research project, and I am investigating the nexus between the digital divide, income inequality and social cohesion n under the supervision of Professor Brian Armstrong. This research project aims to determine the extent of the digital divide and income inequality and how they inhibit the attainment of social cohesion in South Africa. As part of this project, I would like to invite you to take part in answering a questionnaire. This activity will involve approximately 60 questions and take 10-15 minutes to complete.

If you participate in this project, there will be no personal costs. You will not receive any direct benefits from participation, but there are no disadvantages or penalties if you do not choose to participate or withdraw from the study. You may withdraw at any time or not answer any question if you do not want to. The questionnaire will be completely confidential and anonymous, as I will not ask for your name or any identifying information, such as your name and ID number. The information you give me will be held securely and not disclosed to anyone else. If you experience any distress or discomfort during this process, we will stop completing the questionnaire or resume another time.

If you have any questions during or afterwards about this research, please contact me at the details listed below. This study will be written up as a research report online through the university library website. If you wish to receive a summary of this report, I will gladly send it to you (optional). The data collected from this research project will be stored in a password-protected computer for ten years. With your permission, the data collected from this research project may be used by other researchers in an anonymized format. If you have any concerns or complaints regarding the ethical procedures of this study, you are welcome to contact the University Human Research Ethics Committee (Non-Medical) by telephone at +27(0) 11 717 1408, email hrecnon-medical@wits.ac.za

Yours sincerely,

Researcher:
Ayanda MagidaAyanda.magida@wits.ac.za; 073 1809335

Supervisor:
Professor Brian Armstrong (Brian.armstrong@wits.ac.za)

APPENDIX C Survey

Introduction

Thank you for your willingness to complete this survey. The study explores the perceptions of income inequality, the digital divide, and social cohesion in South Africa. Please answer all the questions as honestly as possible. Your responses to the survey will be treated confidentially.

Section 1: Your demographic information

Please complete the following table of demographic information:

RESPONDENT'S BIOGRAPHICAL DATA			
1.1	Age in years		
1.2	Gender	Male	
		Female	
1.3	Race	African black	
		White	
		Coloured	
		Indian/Asian	
1.4	Region	Urban	
		Rural	
1.5	Education	Primary	
		Secondary	
		Tertiary	
1.6	Occupation	Unemployed	
		Employed	
		Self-employed	
		Student	
		Retired/pension	
1.7	What is your home language	English	
		Afrikaans	
		IsiXhosa	
		IsiZulu	
		Sesotho	
		Setswana	
		Tsonga	
1.8	English language proficiency	Speak	
		Write	
		Read	

Section 2: Income-related information

The following list contains some of the income-related questions.

2.1.	What is your primary source of income?	Salary	
		Grant	
		Pensions	
		Remittances	
		Other	
2.2	What is your monthly income?	R3500<	
		R3500- R7500	
		R7500-R15000	
		R15000-R25000	
		R26000 >	

Section 3: Digital divide

The following list contains questions concerning access to digital technologies.

3.1	Access to smartphone	Yes	
		No	
3.2	Internet Access	Yes	
		No	
3.3	How do you access the internet	Mobile phone	
		Tablet/iPad	
		Laptop	
3.4	Modes of internet access	Wireless	
		Mobile	
		Broadband	
		DSL	
3.5	Access the internet from	Home	
		Work	
		Friends	
		Other (specify)	
3.6	How much is spent on the internet monthly	R50-R100	
		R100-R250	
		R250-R500	
		R500-R1000	
		R1000	
		Don’t know	
3.7	Monthly Internet data use/subscription	<20GB	
		20-50 GB	
		50-150 GB	
		150-250GB	
		250+GB	
		Don’t know	
3.8	How much time do you spend on the internet daily (Hours)	≤1	
		2-3	
		≥4	

Benefits associated with being online adapted from Van Deursen & Helsper (2015)

The following contains statements on the benefits associated with being online. To what extent do you agree or disagree with the following statements (Please tick the appropriate (there are no right or wrong answers).

Domain		Statement	Strongly Agree	Agree	unsure	Disagree	Strongly disagree
3.9	**Income**	Look for information on the price of a product (e.g., books, holidays, clothes, cars)					
3.10		Purchase a product online (e.g., on Take a Lot, Amazon)					
3.11		Look for information on how to sell something you own					
3.12		Respond to people's requests for information about a product or service you want to sell					
3.13	**Employment**	Look for something (e.g. software, devices, apps, instruments, kit etc.) that would help you do your job better.					
3.14		Talk to others online about how to solve a job-related problem (e.g. via email, social networking site, or forum)					
3.15		Integrate tools or apps you have downloaded into the way you work. Look for a different job online.					
3.16		Talk to others online about job opportunities (e.g. email, social networking site, or forum)					
3.17		Create or share a CV on a professional and work-related site (e.g. LinkedIn, Career Junction)					
3.18		Working remotely					
3.19	**Finance**	Look for information on insurance policies (e.g. car/health/life or other insurance)					
3.20		Compare reviews of insurance policies (e.g. car/health/life or other insurance). Purchase insurance online (e.g. car/health/life or other)					
3.21		Use it for banking online.					
3.22		Use it for purchasing online or e-commerce.					
3.23	**Education**	Look for information about a course or course provider (s)					
3.24		Check others' opinions about a course or place to study.					
3.25		Download course materials					
3.26		Upload an assignment/piece of work for valuation.					
3.27		Study online or attend online courses.					
3.28		Distance learning					
3.29		Access e-books					
3.30	**Belonging**	Chat about relationships and friendships (e.g. via email, a social networking site, etc.)					
3.31		Look up information on where to go out (e.g. exhibitions, cinema, parties, hiking)					
3.32		Read information on parenting.					
3.33		Look up information on transport (e.g. bus or train, tickets timetables)					
3.34		Upload pictures of yourself on social media sites (Twitter, Facebook, Instagram)					

3.35	**Identity**	Come across information about your ethnic group					
3.36		Interact with people who share your ethnicity (e.g. via email, WhatsApp, forum or social networking site)					
3.37		Interact with people who are from a different ethnic group (e.g. via email, WhatsApp, forum or social networking site)					
3.38		Look for websites with religious or spiritual information.					
3.39		Log in on a website with religious or spiritual content.					
3.40	**Bonding and informal networks**	Look for updates from friends or family (e.g. email, status/photos on social networking sites)					
3.41		Comment on the updates friends or family put online (e.g. email, status/photos on social networking sites)					
3.42		Talk to family or friends who live further away (e.g. via Skype, zoom, Facebook, WhatsApp, or email)					
3.43		Share pictures of you with your family or friends (e.g. through a social networking site, photo sharing site)					
3.44		Look for websites online that help you to meet new people (e.g. online dating, social networking sites, hobby or crafts clubs)					
3.45		Make new friends /meet new people.					
3.46		Like or promote content that other people post					
3.47	**Personal wellbeing**	Come across online lifestyle magazines/features/articles. Talk to others about your lifestyle.					
3.48		Blog or maintain a website about your personal life					
3.49		Look for jokes, cartoons or other entertaining content.					
3.50		Play games					
3.51		Listen to music					
3.52		Watch videos/ TV programmes.					
3.53	**Self-actualisation**	Discuss a topic of personal interest with others online (e.g. via email, Twitter, Facebook, or online forum)					
3.54		Share something you created about a topic that interests you (e.g. a piece of creative writing, a video, a photo)					

Section 4: Social cohesion adapted from SARB.

The following section covers questions concerning your perceptions of social cohesion in South Africa. To what extent do you agree or disagree with the following statements?

#	Statement	Strongly Disagree	Disagree	Unsure	Agree	Strongly
4.1	You feel proud to be South African					
4.2	How much do you trust other South African					
4.3	Being a South African is an integral part of how you see yourself.					
4.4	You would want your children to think of themselves as South African.					
4.5	Being a South African is an integral part of how you see yourself.					
4.6	It makes you proud to be called a South African					
4.7	You would want your children to think of themselves as South African					
4.8	Being a South African is a significant part of how you see yourself.					
4.9	All people who were born in this country, regardless of what the group they belong to should be treated as equal citizens of South Africa					
4.10	It is desirable to create one united South African nation out of all the diverse groups who live in this country					
4.11	It is possible to create such a united South African nation. a					
4.12	People should realise we are South Africans first and stop thinking of themselves in terms of their group.					

APPENDIX D PIS Interviews

Participant Information Sheet: In-depth interviews

Invitation to participate in a research study: The nexus between the digital divide, income inequality and social cohesion in South Africa.

Good day,

My name is Ayanda Magida, and I am a PhD student at the Wits Business School at the University of the Witwatersrand, Johannesburg. As part of my studies, I have to undertake a research project, and I am investigating the nexus between the digital divide, income inequality and social cohesion n under the supervision of Professor Brian Armstrong. This research project aims to determine the extent of the digital divide and income inequality and how they inhibit the attainment of social cohesion in South Africa. As part of this project, I would like to invite you to take part in a conversation. Our discussion is scheduled to last 1.5 – 2 hours. During our discussion, we will take two short (5-10 minute) breaks not to get too tired.

There will be no personal costs if you participate in this project, and you will not receive any direct benefits. However, there are no disadvantages or penalties if you do not choose to participate or if you withdraw from the study. You may withdraw at any time or not answer any question if you do not want to. The interview will be completely confidential; no identifying information, such as your name and ID number, will be linked to the findings or disclosed in the final report. The information you share with me will be treated confidentially and not disclosed to anyone else. If you experience any distress or discomfort during this process, we will stop completing the discussion or resume another time. In order to capture our discussion for subsequent transcription and analysis, it would be ideal to record the interview with your permission.

If you have any questions during or afterwards about this research, please contact me at the details listed below. This study will be written as a research report and available online through the university library. If you wish to receive a summary of this report, I will gladly send it to you. The data collected from this research project will be stored in a password-protected computer for ten years. With your permission, the data collected from this research project may be used by other researchers in an anonymized format. If you have any concerns or complaints regarding the ethical procedures of this study, you are welcome to contact the University Human Research Ethics Committee (Non-Medical) by telephone at +27(0) 11 717 1408, email hrecnon-medical@wits.ac.za

Yours sincerely,

Researcher: Ayanda Magida (Ayanda.magida@wits.ac.za)
Supervisor: Professor Brian Armstrong (Brian.armstrong@wits.ac.za)

APPENDIX E CONSENT FORM

Study title: The nexus between the digital divide, inequality, and social cohesion in South Africa

The study aims to understand the relationship between the digital divide and social cohesion in South Africa.

The researcher_____Ms Ayanda Magida_ has provided me with a copy of the Participant Information Leaflet and Consent regarding the study and has thoroughly explained to me the nature, risks, benefits and purpose of the study.

I, …….., agree to participate in this research project. The research has been explained to me, and I understand what my participation will involve. I agree to the following:

To participate in the study	**Yes**	**No**
I agree that my participation will remain anonymous.		
I agree that the information I provide may be used anonymously after this project has ended for academic purposes by other researchers, subject to their own ethics clearance being obtained.		

PARTICIPANT Consent:

Participant Printed Name_____

_____Signature / Mark or Thumbprint_____Date and Time

Researchers Printed Name_____Signature / Mark or Thumbprint_____Date and

APPENDIX E Interview Guide

Digital Divide

1. What is your understanding of the digital divide?
2. In your view, do you think the digital divide exists in SA?
    - Why? Expand
3. In your opinion, what factors contribute to the digital divide in South Africa?
4. How does the digital divide affect you directly or indirectly?
5. What are some of the challenges you have experienced concerning accessing and using digital technologies, the internet, if any?
    a. How they access the internet,
6. What are some of the benefits you have derived by accessing and using digital technologies?
7. When online, what do you usually use digital technologies for?
8. How did COVID-19 influence access and usage of digital technologies?
9. What are some of the challenges did you experience with accessing digital technologies during Covid-19?
10. In your opinion, do you think that covid-19 has further perpetuated the digital divide? And Why?
11. How can we bridge the digital divide in SA?
1. Do you think that covid-19 has further perpetuated or bridged the income inequality gap?

Social cohesion

In 1994, South Africa moved to a new dispensation; a rainbow nation was pronounced.

1. What is your understanding of the rainbow nation?

2. What is your understanding of social cohesion, and do you think South Africa is a socially cohesive country?

3. What, in your view, are the barriers to making SA a socially cohesive country?

4. What are your views on multiculturalism (tolerance of diversity) in SA?

    - Trust and solidarity network ties

5. What, in your view, makes the society to be cohesive?

6. In your opinion, do you think that covid-19 has made SA people be more cohesive?

Concluding questions

1. What recommendations can you offer towards bridging the inequality gap and the digital divide?

2. What recommendations can you offer towards building a socially cohesive South Africa?

3. Is there anything else you would like to share with me?