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Digital Equity as a Solution to Digital Redlining in South Africa

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DECLARATION

I, Mashukela Elizabeth Mokoena (Student number:0008244N), hereby state that this Applied Research Project (ARP) titled "Digital Equity as a Solution to Digital Redlining in South Africa" is my own original work. Unless it says otherwise, all the sources mentioned have been looked at. This ARP is part of the standards for the Master's in Business Administration degree at the Witwatersrand Business School (Wits Business School), University of the Witwatersrand, Republic of South Africa. Also, I want to say that neither I nor anyone was turned in this work for an educational certificate or degree at any other college or university.

MASHUKELA ELIZABETH MOKOENA
(MBA CANDIDATE)

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I would like to acknowledgement to Dr. Bongani Munkuli, for his support and guidance during my academic journey. Your encouragement went a long way.

In loving memory and deepest gratitude, I dedicate this tribute to my beloved parents, Frans and Senate Mokoena. Their lives were a testament to sacrifice, boundless love, and a steadfast commitment to nurturing the seeds of continuous learning and personal growth. To you, dear Bahlakwane Babatle, your legacy lives on in our hearts.

To my dear late friend, Kaylum Patrick White, this is a promise fulfilled, continuing the journey we embarked on together and laying the groundwork for the generations yet to come.

To my cherished and diverse family, encompassing the Mokoena's, Moshoeshoe, and Makhathini lineage, mere words cannot express the depth of gratitude I feel for your unwavering support throughout my journey. Kelebohile batho beso.

A special acknowledgment goes to my sister, Matladi Msibi, and her household. Your unwavering support and boundless wisdom have been the cornerstone upon which I've built my dreams. With heartfelt thanks, I acknowledge the love and strength you've bestowed upon me; together, we can indeed move mountains.

SUPPLEMENTARY INFORMATION

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ABSTRACT

Introduction: Ensuring digital equity is vital for providing fair access to and benefits from digital resources. Given the persistence of the digital divide, understanding the factors that contribute to digital equity is crucial for creating inclusive digital environments. This study explores three key factors: access to digital infrastructure, digital literacy, and the availability of high-quality content.

Aims and Objectives: This study aims to investigate the factors influencing digital equity by examining the impact of digital infrastructure, digital literacy, and high-quality content on digital inclusion. It also seeks to understand how these elements interrelate to promote a more equitable digital environment**.**

Method: A quantitative approach was utilized, involving surveys to measure access to digital infrastructure and levels of digital literacy, complemented by qualitative interviews to assess the quality and impact of digital content. Data analysis focused on exploring the relationships between these factors and their effects on digital equity.

Results: The results reveal significant correlations between access to digital infrastructure and digital equity, with improved infrastructure supporting better digital inclusion. Digital literacy emerged as a key factor for effectively utilizing digital resources, while high-quality content was found to enhance the value of digital access. The study highlights the interconnected nature of these factors in advancing digital equity.

Discussion and Conclusion: The findings emphasize the need to address digital infrastructure and literacy to achieve greater digital equity. High-quality content is essential for maximizing the benefits of digital access. A comprehensive approach that integrates improvements in infrastructure, digital skills development, and content quality is crucial for promoting a more equitable digital environment. Future research should focus on these interconnected factors to bridge the digital divide more effectively**.**

Key words: Digital content, digital equity; digital devices, digital divide; digital infrastructure; digital literacy; digital redlining; policy and regulation

DEFINITION OF KEY CONCEPTS

Digital Content: Online information, apps, and services are examples of digital content.

Digital equity: Full involvement in society, democracy, and the economy requires digital equity.

Digital devices: Computers, smartphones, and tablets are examples of digital products whose availability and price can have a substantial impact on digital equity

Digital divide: The digital gap limits equal participation and opportunity in all aspects of life, hurting people of colour, Indigenous peoples, low-income households, people with disabilities, and older adults disproportionately.

Digital Infrastructure: The availability and quality of digital infrastructure, such as broadband internet, cellular networks, and Wi-Fi hotspots, can have a substantial impact on digital equity.

Digital Literacy: The skills, knowledge, and attitudes required to effectively use digital technology are referred to as digital literacy.

Digital redlining: Digital redlining is discrimination by internet service providers on the basis of income, race, and ethnicity.

Policy and Regulation: Policy and regulation can have a considerable impact on digital equity, both positively and negatively.

ABBREVIATIONS	
4IR	Fourth Industrial Revolution
ITU	International Telecommunications Union
NGO	Non-Governmental Organization
ICASA	Independent Communications Authority of South Africa
ICT	Information Communications Technology
NPC	National Planning Commission
IS	Information System

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1. CHAPTER 1. INTRODUCTION

1.1. Introduction

This research evaluates the "Digital Equity as a Solution to Digital Redlining in South Africa". The purpose of this study is to explore the factors contributing to digital equity. This chapter outlines the background to the study (Section 1.2), The research conceptualisation section provides for the research problem statement (Section 1.3) and consequently the objectives of this research (Section 1.3.1) as well as the research questions (Section1.3.2). The delimitations and assumptions of the research study are in Section 1.4 while we discuss the significance of the research study in Section 1.5 and provide a preface to the research report in Section 1.6.

1.2. Background to the study

Digital redlining is the systematic exclusion of from low-income and minority populations from accessing high-speed internet and other digital services, reinforcing existing inequities in education, employment, and civic participation (Crawford, 2023). This exclusion creates a digital divide, an increasing reality marked by the disparity between those with full access to digital technologies and those with only partial access (Napoli & Obar, 2020). The implications of digital redlining are profound, as it perpetuates socio-economic disadvantages and restricts opportunities for marginalized communities (Ali, 2020). In South Africa, the digital divide is stark, with urban populations generally more digitally ready and rural populations lagging due to higher costs and inadequate infrastructure (Gillwald et al., 2021). Notably, 55% of the population lives below the poverty line, many with low educational levels and insufficient e-skills necessary for leveraging new technologies and services associated with the Fourth Industrial Revolution (4IR) (Reddy et al., 2022).

Bassette (2023) emphasizes that bridging the digital divide requires more than just expanding internet access. It also involves enhancing digital literacy and skills (Bessette, 2023). The International Telecommunication Union (ITU) reports that only 28.7% of individuals in Africa had internet access in 2021, far below the global average of 53.6% (ITU, 2021). This digital divide is influenced by factors such as poverty, inadequate infrastructure, and limited digital literacy, highlighting the need for comprehensive strategies to address these issues (Friemel, 2022).

Efforts to bridge the digital divide involve governments, NGOs, and private sector companies working together to expand internet infrastructure, provide digital literacy training, and increase access to affordable devices (Robinson et al., 2021). Despite these initiatives, achieving global digital equity remains a significant challenge. This research will explore potential remedies to digital redlining, including infrastructure investment, public-private collaborations, and community-led initiatives (Bessette, 2023).

South Africa has demonstrated significant advancements in improving digital access and inclusion in recent years. Despite these efforts, persistent inequalities in internet access and usage continue to exist throughout the country, exacerbated by the concept of digital redlining. Digital redlining refers to the systematic exclusion of certain demographic groups, particularly low-income and minority populations, from access to high-quality digital services (Gillwald, 2019). This exclusion perpetuates socio-economic inequalities by limiting opportunities for education, employment, and civic participation among marginalized communities.

According to the World Bank's 2020 World Development Report, South Africa had an internet penetration rate of approximately 56% in 2018, underscoring that nearly half of the population lacked internet connectivity (World Bank, 2020). Moreover, there is a pronounced urban-rural divide in internet access, with urban areas enjoying higher penetration rates compared to rural regions (Rao & Mutemwa, 2019). This disparity highlights uneven infrastructure development and access to digital resources, contributing to broader socio-economic disparities.

Affordability remains a critical barrier to internet access in South Africa. The Independent Communications Authority of South Africa (ICASA) reported in 2019 that broadband services in the country are relatively costly compared to other countries in the region (ICASA, 2019). High costs prohibit many low-income households from accessing the internet, thereby hindering their ability to leverage digital opportunities for socio-economic advancement (Mothobi & Gillwald, 2018). Furthermore, the economic disincentives for internet service providers to extend infrastructure to rural and low-income areas exacerbate the digital divide, limiting access to essential digital services and opportunities (Mothobi & Gillwald, 2018).

Digital literacy and skills represent another critical dimension of digital redlining in South Africa. Even when internet access is available, significant portions of the population lack the necessary skills to effectively utilize digital technologies (Ragnedda & Ruiu, 2020). This skills gap is particularly acute in rural and peri-urban areas, where access to formal ICT education and training programmes is limited (Barnard-Ashton et al., 2018). The integration of ICT education into foundational and secondary schooling remains inadequate, as evidenced by the insufficient presence of internet-connected schools and computer centres across the country (Department of Basic Education, 2015). This educational deficit perpetuates long-term digital exclusion and inequities in digital literacy.

Addressing these challenges necessitates a comprehensive approach. The National Planning Commission (2020) advocates for the digitization of the public sector to enhance service delivery and efficiency across departments. Moreover, substantial investments in human capital development are crucial to equipping individuals with the digital skills required to thrive in a technology-driven society (National Planning Commission, 2020). Efforts to bridge the digital divide require collaboration among government entities, non-governmental organizations, and private sector stakeholders to expand internet infrastructure, promote digital literacy, and ensure affordable access to digital devices as inscribed in Figure 1 (Van Deursen & Van Dijk, 2021).

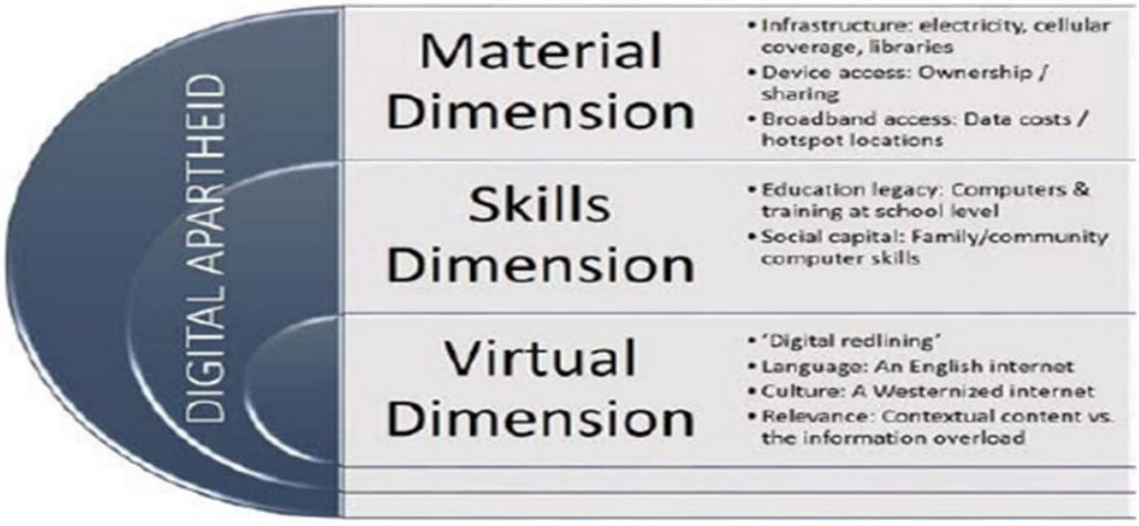


Figure 1: Dimensions of Digital Redlining (Source: Sorj, 2008)

Digital redlining in South Africa highlights the significant inequalities in digital technology access based on geographical and socio-economic factors (Van Deursen & Van Dijk, 2021).

Although there is limited current research on digital redlining in South Africa, the ongoing discrepancies in technology access emphasise the immediate necessity for specific actions aimed at attaining digital equity (Rao & Mutemwa, 2019). To tackle these inequalities, it is crucial for policymakers, stakeholders, and communities to collaborate to guarantee that every individual has equitable access to and can take use of digital resources and opportunities in an interconnected digital world.

1.3. Problem Statement

In South Africa, digital redlining poses a significant challenge to achieving digital equity, marked by a critical gap in resources and understanding. Digital redlining refers to the systematic exclusion of marginalized communities, such as low-income and minority populations, from accessing high-quality digital services, exacerbating socio-economic inequality limiting opportunities for education, employment, and civic engagement (Gillwald, 2019; ICASA, 2019).

The problem is the systematic exclusion of marginalized communities, such as low-income and minority populations, from accessing high-quality digital services, exacerbating socio-economic inequality limiting opportunities for education, employment, and civic engagement. Economic inequalities, inadequate digital infrastructure, and limited digital literacy exacerbate the exclusion of marginalized groups from digital resources and opportunities (Van Deursen & Van Dijk, 2021).

The consequences of digital redlining are profound and pervasive, affecting individuals, communities, and society. Marginalized populations face restricted access to essential online services, educational resources, and economic opportunities, perpetuating cycles of poverty and inequality. Moreover, the digital divide exacerbated by redlining undermines efforts towards societal progress and inclusive development (Rao & Mutemwa, 2019).

As a starting point to tackle the complex issue of digital redlining in South Africa, researchers are urged to explore the underlying factors contributing to digital redlining in South Africa, and their impact on digital equity. Addressing the research gap on digital redlining is crucial for dismantling barriers to digital inclusion and ensuring that all segments of society can benefit

from the opportunities afforded by digital advancement. Therefore, this study aims to investigate the factors contributing to digital equity.

1.3.1. Research Objectives

To achieve the aim of the study, the following objectives are brought forward:

- To investigate access to digital infrastructure.
- To investigate the role of digital literacy
- To investigate the role of high-quality digital content in promoting digital equity,
- To examine the relationship between access to digital infrastructure and digital equity
- To examine the relationship between access to digital literacy and digital equity
- To examine the relationship between high quality content and digital equity

1.3.2. Research Questions

The following research questions are brought forward:

- What is the impact of access to digital infrastructure on digital equity?
- What role does skills development, specifically digital literacy, play in promoting digital equity?
- What contribution does the availability of high-quality digital content make to digital equity?
- What is the relationship between access to digital infrastructure and digital equity?
- What is the relationship between digital literacy and digital equity?
- What is the relationship between s the quality of digital content have on digital equity?

1.4. Delimitations and Assumptions of the Study

The study assumes that all participants have basic access to digital devices and the internet, and that participants will provide honest and accurate information during surveys and interviews. It also assumes that redlining practices, both historical and contemporary, have a measurable impact on digital equity in the selected urban areas.

The root causes of digital inequity and redlining in South Africa are multifaceted, including historical redlining practices, economic inequality, infrastructure disparities, education

disparities, and policy and regulation issues. Addressing infrastructure inequalities critical as it directly impacts the accessibility and quality of digital services. Examining economic inequality allows the study to highlight how income inequality affect access to digital technologies and propose solutions to bridge the economic gap.

Delimitations aid in narrowing the scope of the study and defining its bounds, providing more targeted and meaningful insights into the specific aspects of digital equity and redlining in South Africa. By focusing on specific urban areas, a manageable sample size, a defined timeframe, and tailored recommendations, the study can provide actionable insights that are relevant and feasible for policymakers and local authorities to implement.

1.5. Significance/contributions of the study

To provide a compelling argument for the significance of studying digital equity as a solution to digital redlining in South Africa, it is essential to discuss the consequences of neglecting this problem and how addressing it can contribute to knowledge in the field, inform policy, and change perceptions.

Neglecting the issue of digital redlining can have severe consequences, as highlighted in recent literature. Popiel and Pickard (2022) emphasize that the lack of focused and integrated municipal broadband legislation creates legal barriers for cities to connect their vulnerable populations. This results in exorbitant costs, inadequate internet speeds and quality, and perpetuates digital illiteracy. Lambright (2019) adds that platforms like Nextdoor exacerbate racial profiling, further marginalizing already disadvantaged communities. These studies underscore the urgent need for targeted interventions to address digital redlining, as its unchecked continuation exacerbates socio-economic disparities.

Addressing digital redlining through a study on digital equity in South Africa is crucial for several reasons. Firstly, it fills a significant gap in current literature by focusing specifically on the dynamics of digital exclusion in urban South African contexts. While existing research acknowledges digital divides globally, there is a paucity of detailed studies that comprehensively address the unique socio-economic and infrastructural challenges in South Africa's urban areas (Popiel & Pickard, 2022).

Moreover, this study extends current knowledge by proposing digital equity as a strategic solution to digital redlining. By understanding and mitigating the root causes of digital exclusion such as economic inequality, infrastructure disparities, and policy inadequacies this research can pave the way for more inclusive digital development policies and practices in South Africa. It takes up the critical question of how to ensure equitable access to digital resources in a country marked by historical inequalities and uneven development (Lambright, 2019).

From a practical standpoint, the findings of this study can inform policymakers, government agencies, NGOs, and urban planners in developing targeted interventions to bridge the digital divide. By identifying and addressing the specific barriers to digital access faced by marginalized communities, such as inadequate infrastructure and digital literacy, this research can guide the formulation of policies that promote equitable digital inclusion. This is crucial not only for enhancing socio-economic opportunities but also for fostering a more cohesive and resilient society in South Africa (Popiel & Pickard, 2022).

Furthermore, understanding and addressing digital redlining through the lens of digital equity can potentially change how these concepts are perceived in the field of digital inclusion and development. By highlighting the socio-economic, educational, and civic implications of digital exclusion, this study can catalyse a paradigm shift towards more holistic approaches to digital development that prioritize equity and inclusivity (Lambright, 2019).

The study of digital equity as a solution to digital redlining in South Africa is not merely an academic exercise but a vital endeavour with practical implications for policymaking, social justice, and economic development. By filling the gaps in current knowledge, proposing new solutions, and informing policy and practice, this research can contribute significantly to fostering a more inclusive digital society in South Africa and beyond.

1.6. Research Chapter Outline

This, study has six chapters. Chapter 1 gives us an introduction to the study background; problem statement, research objectives; research questions, propositions, delimitations and

assumptions and the significance of the study. The rest of the study is divided as follows Chapter 2 provides a literature review covering the problem, the past studies, the theoretical framework and the conceptual framework, the legislative Perspective. reviews and the hypotheses development. Chapter 3 discusses the research paradigm, research design, data collection, population and sampling procedure, research instruments and data analysis reliability and validity measures as well as ethical considerations. Chapter 4 provides a presentation of results. Chapter 5 presents and discusses the findings, respectively, to interrogating the research questions while and Chapter 6 summarises and concludes the research.

2. CHAPTER 2. LITERATURE REVIEW

2.1. Introduction

The literature review section is the most critical component of the research, and it serves to contextualize the research by situating it within the existing body of knowledge. This section identifies the gaps and limitations and reveals areas where current research is lacking or incomplete. Furthermore, it will inform our methodology where it helps select appropriate research designs, methods and research instrument as indicated in Chapter 3. Furthermore, it provides a theoretical framework where the grounds of the study are relevant in relation to theories and concepts. This sections also enhances the validity and reliability which demonstrates awareness of potential biases and limitations. It further enables comparison with other studies and generalization of findings by facilitating comparisons and generalizations. In supporting ethical research practices, it ensures awareness of ethical considerations and avoids duplication of prior research. Finally, it adds to the collective knowledge and advancement in the field.

2.2. Background

Leah and Sharon (2003) define digital equity as an environment where there is equal access to technology, skills and literacy, inclusion, affordability, cultural relevance, equitable outcomes, social and economic impact, and policy advocacy. They emphasize the goal of eliminating inequality in digital participation, breaking down barriers, and ensuring equitable outcomes for diverse demographic groups. This definition aligns with the pervasive theme of digital equity in Information Systems literature, as demonstrated by various scholars. Pittman, Vasagam and Floyd (2021) highlights its significance in examining the impact of Information Systems on impoverished and marginalized populations within the context of electronic government (Pittman et al., 2021), while (Aguilar, 2020). asserts its crucial role in Information Systems education Ryu et al. (2020), contribute to this discourse by highlighting the importance of digital equity and cyber wellness in the Information Society (Ragnedda, 2020).

In terms of its origins, digitization has roots tracing back to the development of digital computers in the mid-20th century, with widespread adoption of the internet in the 1990s marking a significant turning point (McMullan, 2020). Digitization has been hailed as one of

the most significant technological developments of recent decades, transforming various aspects of human life (Haleem et al., 2022). While offering increased efficiency and convenience, digitization also poses significant challenges and potential negative impacts that need to be addressed (Haleem et al., 2022). The rise of digital technologies, including the widespread adoption of social media platforms, has transformed communication and interaction patterns, with implications for social relationships, mental health, and privacy (Haleem et al., 2022; Kraus et al., 2021). Additionally, digitization has the potential to reduce carbon emissions and promote sustainability in industries such as transportation and energy, although environmental concerns regarding production, disposal of digital devices, and energy consumption remain pertinent (Kraus et al., 2021).

Digitization has democratized information access, transformed communication, and impacted various sectors including commerce, entertainment, and healthcare (Omer, 2022). It has facilitated global development and economic growth, particularly in emerging markets, by enabling new opportunities for innovation and connectivity (Xia et al., 2024).

While digital technologies have enabled new opportunities for automation and efficiency, they have also led to the displacement of many traditional jobs, particularly in industries such as manufacturing and retail (Xia et al., 2024). Authors Gherghina., Botezatu, & Simionescu, (2021) confirm that the rise of e-commerce has contributed to the decline of traditional brick-and-mortar retail stores and the loss of jobs in that sector. This has raised concerns about the future of work, with Kolade & Owoseni (2022) predicting significant disruptions to the labour market in the years to come. According to a study by the World Economic Forum, it is estimated that by 2025, automation and digitization could displace 85 million jobs globally in industries such as manufacturing, retail, and customer service. The rise of e-commerce has contributed to the decline of traditional brick-and-mortar retail stores, leading to job losses in that sector (World Economic Forum, 2020). Additionally, advancements in artificial intelligence and machine learning have the potential to automate tasks previously performed by humans, such as data analysis and customer support (World Economic Forum, 2020).

Rothe, Van Audenhove & Loisen (2023) state that it is imperative to consider the potential limitations and inequalities associated with digitization, as not everyone possesses access to the

requisite technology or resources essential for full participation in a digitized environment. Furthermore, this digital divide can exacerbate existing social and economic inequalities (Rothe et al., 2023). This divide can manifest in many ways, from inequalitiein access to education and healthcare to inequalities in employment and income (Rothe et al., 2023).

Digitization has had a significant impact on global society, transforming the way people live, work, and interact with each other. While there are many benefits to digitization, including increased efficiency and access to information, there are also significant challenges that need to be addressed, including social inequality, privacy concerns, and the potential for job displacement. As digital technologies continue to evolve, it will be important to address these challenges to ensure that the benefits of digitization are shared widely and equitably across society.

2.3. Cultural Perspective

Global Perspective

The global perspective on digital equity highlights a diverse range of challenges and solutions. In developing countries, the focus is often on building infrastructure and basic access (Rao & Mutemwa, 2019). The International Telecommunication Union (ITU, 2021) emphasizes the need for international cooperation and funding to support digital infrastructure projects in these regions.

Conversely, in developed countries, the emphasis is on ensuring that all citizens have equal opportunities to benefit from digital advancements. The Australian Digital Inclusion Index, for example, provides a detailed assessment of digital inclusion across different demographics and regions, helping to inform targeted policy interventions (Wilson, Thomas, & Barraket, 2019).

The legislative parameters for digital equity as a solution to digital redlining are multifaceted and require a nuanced approach. While significant progress has been made, particularly in developed regions, challenges remain in ensuring that these policies are effectively implemented and adapted to the diverse needs of global communities. Future legislative efforts must adopt a holistic and context-specific approach, supported by international cooperation and robust implementation strategies, to truly bridge the digital divide and combat digital redlining.

The United States has implemented various legislative measures to mitigate digital redlining, reflecting an evolving approach to ensuring digital equity. These measures, while aimed at promoting competition and extending services to underserved areas, have had mixed success in addressing the needs of marginalized communities.

The Telecommunications Act of 1996 was a landmark legislative effort aimed at deregulating the telecommunications industry. Its primary goals were to foster competition, reduce prices, and extend telecommunications services to underserved areas (Gillwald, Moyo, & Rademan, 2021). However, critics argue that the Act has fallen short in addressing the needs of marginalized communities. Lambright (2019) contends that rather than bridging the digital divide, the Act has often exacerbated it, primarily due to its failure to ensure equitable access to the latest technologies and infrastructure improvements across all demographic groups.

The Broadband Deployment Accuracy and Technological Availability (DATA) Act of 2020 represents a significant legislative attempt to improve broadband access in the United States. The Act mandates more precise data collection on broadband availability, which is crucial for identifying underserved areas more accurately (Gillwald, 2019). The improved granularity of data is intended to better inform policy decisions and funding allocations, ensuring that resources are directed where they are most needed. According to Peha (2020), this Act is a step forward in addressing the inaccuracies and gaps in previous broadband maps, which often overlooked rural and low-income urban areas.

In response to the COVID-19 pandemic, the U.S. government introduced the Emergency Broadband Benefit Programme to provide temporary relief to low-income households. This programmeme offered subsidies to help cover the cost of broadband internet, aiming to ensure that vulnerable populations could maintain internet access during the crisis (Brookings, 2020). While this initiative was crucial in the short term, providing immediate assistance to millions of households, it has been criticized for being a reactive rather than a proactive measure. According to Whitacre, Gallardo, and Strover (2020), such emergency measures, while beneficial, do not address the underlying systemic issues that perpetuate digital redlining.

The Infrastructure Investment and Jobs Act (IIJA), signed into law in 2021, includes significant investments in broadband infrastructure. The Act allocates $65 billion to improve broadband access, focusing on extending high-speed internet to rural and underserved urban areas (Federal Communications Commission, 2021). The IIJA aims to address the digital divide comprehensively by funding infrastructure projects, affordability programmes, and digital literacy initiatives. This Act represents a more holistic approach to tackling digital redlining, recognizing the multifaceted nature of digital inequities (Horrigan, 2021).

Despite these legislative efforts, challenges remain in effectively mitigating digital redlining. One significant critique is that many of these measures focus predominantly on infrastructure and access, often overlooking the equally important issues of affordability and digital literacy (Napoli & Obar, 2020). For example, while the Broadband DATA Act improves the accuracy of data collection, it does not directly address the affordability of broadband services or the digital skills necessary for meaningful internet use.

Furthermore, implementation and enforcement of these legislative measures vary significantly across different states and localities, leading to inconsistent outcomes. As highlighted by Bode (2021), the lack of a coordinated national strategy and the reliance on state-level execution can result in inequalitiein how effectively these policies address digital redlining.

The European Electronic Communications Code (EECC), implemented in December 2018, aims to harmonize and update the regulatory framework for electronic communications in the EU. It emphasizes the importance of universal service obligations (USOs), ensuring all citizens have access to quality broadband services at an affordable price (Directive (EU) 2018/1972). However, its effectiveness is contingent upon national implementations, and some member states have been slower to adopt comprehensive measures, leading to uneven progress across Europe (Bauer & Bohlin, 2020).

The Digital Agenda for Europe (DAE), part of the Europe 2020 Strategy, outlines initiatives to promote digital literacy, skills, and inclusion, setting targets for broadband access and digital literacy improvement (European Commission, 2019). Despite its ambitious goals, the DAE has faced challenges in addressing the deep-rooted socioeconomic factors contributing to digital

inequity. Progress has been noted, but the pace is often hindered by financial and infrastructural constraints in less developed regions (Van Dijk, 2020).

The Connecting Europe Facility (CEF) provides funding for trans-European networks, including digital infrastructure, aiming to support projects that enhance digital connectivity across the continent (European Commission, 2020). While CEF funding has facilitated numerous projects, the allocation process can be complex and competitive, often disadvantaging smaller, less resourced communities that are most in need of digital infrastructure upgrades (Falch, 2019).

The European Pillar of Social Rights (EPSR), proclaimed in 2017, includes principles that indirectly support digital equity, such as access to essential services and inclusive education and training (European Commission, 2017). However, the EPSR's impact on digital equity is indirect and largely dependent on how member states incorporate its principles into national policies. There is a need for more explicit and targeted legislative measures focusing directly on digital redlining (Hoffmann & Kölling, 2020).

European countries exhibit significant variations in implementing digital equity initiatives. Scandinavian countries, known for high digital literacy and comprehensive broadband coverage, have effectively utilized EU frameworks to enhance digital equity (Sjöberg, 2021). In contrast, countries in Southern and Eastern Europe often lag behind due to economic constraints and infrastructural challenges. National efforts in these regions are sometimes insufficiently supported by EU measures, necessitating more robust and targeted interventions (Ragnedda & Ruiu, 2020).

Inequalitiein funding and implementation remain a significant challenge. The EU's funding mechanisms need to be more accessible and equitable, ensuring that under-resourced communities can effectively compete for and utilize these funds (Vincze, 2020). There is also a need for better integration of digital equity goals across different policy areas, such as education, economic development, and social services. This requires coordinated efforts at both the EU and national levels (Cruz-Jesus, Oliveira, & Bacao, 2020).

Asian Perspective

In Asia, digital redlining is evident through inequalitiein broadband access, digital literacy, and affordability, often concentrated in rural, low-income, and minority communities (Helsper, Van Deursen, & Eynon, 2019). These inequities are exacerbated by rapid urbanization and economic development, resulting in significant infrastructure gaps between urban and rural areas (Galperin, 2020).

India’s Digital India Programmeme, initiated in 2015, aims to empower citizens through digital infrastructure, governance services, and digital literacy. However, challenges such as uneven implementation and bureaucratic inefficiencies hinder its effectiveness, particularly in rural areas (Digital India, 2020; Ranjan, 2020).

China's Internet Plus Initiative, launched in 2015, integrates mobile internet, cloud computing, and big data to spur economic growth and digital inclusion. Despite driving technological advancements, the initiative has been critiqued for widening regional disparities, favouring urban over rural development (Li, 2021; Zhong, 2020).

Japan's Society 5.0 envisions a smart society by merging cyberspace with physical infrastructure, targeting sectors like healthcare and logistics. However, challenges persist in addressing the digital divide among elderly and rural populations, necessitating more inclusive strategies (Cabinet Office Japan, 2020; Fukuda, 2021).

South Korea's Smart Korea 2025 focuses on enhancing digital infrastructure and literacy nationwide. While successful in achieving high digital penetration, the initiative faces challenges in bridging urban-rural divides and ensuring inclusivity for vulnerable populations (Kang, 2021; Lee & Shin, 2021).

Asian countries vary in their implementation of digital equity initiatives. High-income countries like Japan and South Korea boast advanced infrastructures but struggle with inclusivity issues among rural and elderly populations. In contrast, middle and low-income countries such as India and Indonesia confront significant barriers including limited resources

and infrastructural gaps, hindering comprehensive digital inclusion efforts (Galperin, 2020; Ranjan, 2020).

African Perspective

Several legislative initiatives exemplify efforts towards digital equity in Africa. South Africa's National Integrated ICT Policy White Paper seeks to ensure universal access to affordable broadband through regulatory reforms and infrastructure sharing yet faces challenges such as slow rural connectivity and inadequate funding for digital literacy programmes (Republic of South Africa, 2020; Dlodlo, 2022). Nigeria's National Broadband Plan (2020-2025) aims for 90% broadband penetration by enhancing regulatory frameworks and fostering public-private partnerships, though hindered by funding gaps and bureaucratic delays impacting expansion into underserved regions (Nigerian Communications Commission, 2020; Olusola & Oyelaran-Oyeyinka, 2021). Kenya's Digital Economy Blueprint 2019-2023 focuses on sectoral digital transformation and inclusivity in e-commerce and financial services yet faces challenges in rural internet accessibility and digital skills development (Government of Kenya, 2019; Ng'ang'a, 2020). Similarly, Rwanda's Vision 2020 and beyond aims to position the country as a knowledge-based economy through extensive digital access initiatives yet struggles with rural connectivity and comprehensive digital skills training (Government of Rwanda, 2021; Karangwa, 2022).

The implementation of digital equity strategies across Africa varies by economic status, with high-income countries like South Africa and Kenya making significant strides in digital infrastructure and literacy, albeit with ongoing challenges in equitable distribution (Dlodlo, 2022; Ng'ang'a, 2020). In contrast, middle and low-income countries such as Nigeria and Rwanda encounter greater infrastructural and economic barriers, necessitating innovative policy approaches and partnerships to bridge the digital divide effectively (Olusola & Oyelaran-Oyeyinka, 2021; Karangwa, 2022).

Key challenges in achieving digital equity include sustainable funding mechanisms, policy coherence aligned with developmental goals, enhanced stakeholder engagement, and robust monitoring and evaluation frameworks to ensure accountability (Milner, 2019; Awojobi & Ndiaye, 2020). These imperatives highlight the need for comprehensive legislative frameworks

tailored to Africa’s diverse socio-economic contexts, aimed at combatting digital redlining and ensuring equitable digital access for all African citizens through innovative and inclusive policies (Republic of South Africa, 2020).

While African nations have made strides in digital equity through initiatives like national broadband plans and digital economy blueprints, persistent inequalities necessitate sustained efforts and adaptive strategies to achieve universal digital inclusion across the continent.

South African Perspective

The policy aiming to ensure universal access to affordable broadband in South Africa, it is essential to delve into the multifaceted approaches and perspectives from both the public and private sectors. The Republic of South Africa's National Integrated ICT Policy White Paper of 2020 represents a strategic initiative aimed at addressing digital inequality across the country by tackling regulatory obstacles and promoting infrastructure sharing.

From a public sector perspective, the government's initiatives are centrally focused on expanding broadband coverage and enhancing digital literacy through concerted public investments and regulatory reforms. This approach highlights a commitment to closing the digital divide that disproportionately affects rural and marginalized urban communities. By investing in broadband infrastructure, the government aims to create an enabling environment conducive to economic growth, social inclusion, and democratic participation (Dlodlo, 2022).

The private sector perspective complements these efforts through partnerships and investments in digital infrastructure. While private entities play a crucial role in expanding broadband access, particularly in urban and more economically viable regions, challenges such as profitability concerns in underserved and remote areas persist. The ICT Sector Council (2021) highlights these profitability challenges as significant barriers to the equitable deployment of broadband infrastructure across South Africa. Despite the potential for profitability in urban centres, rural areas often face higher costs and lower returns on investment, leading to slower deployment rates and perpetuating digital exclusion in these regions.

Moreover, the involvement of the private sector is pivotal in leveraging innovation and efficiency in service delivery, yet it necessitates a balanced regulatory framework that incentivizes investment in underserved areas. The challenge lies in aligning private sector incentives with broader developmental goals, ensuring that digital infrastructure deployment extends beyond commercially lucrative markets to encompass socially impactful outcomes. This requires ongoing dialogue between government regulatory bodies and private sector stakeholders to refine policies that mitigate financial risks and promote sustainable development across all regions of South Africa.

While South Africa's National Integrated ICT Policy White Paper represents a significant step towards achieving universal broadband access, the effectiveness of these initiatives hinges on collaborative efforts between the public and private sectors. Addressing profitability concerns in underserved areas remains a critical challenge that requires nuanced policy interventions and strategic investments to foster equitable digital inclusion nationwide. By enhancing regulatory frameworks and incentivizing private sector engagement, South Africa can move closer to realizing its digital equity goals and ensuring that all citizens benefit from the opportunities afforded by comprehensive broadband access.

South Africa's Digital Transformation Strategy 2020-2030 is a multifaceted approach designed to leverage digital technologies for inclusive economic growth. This strategy places significant emphasis on infrastructure development, digital skills training, and expanding e-government services (Department of Communications and Digital Technologies, 2021). It aims to address the digital divide by fostering an environment conducive to societal development and economic inclusivity.

From a public sector perspective, the government's efforts focus on achieving policy coherence, establishing robust regulatory frameworks, and making targeted public investments to bridge digital divides across socio-economic strata. This involves creating policies that facilitate the deployment of digital infrastructure and ensure its equitable distribution, particularly in underserved rural and marginalized urban areas. Government initiatives include significant investments in broadband infrastructure, supporting digital literacy programmes, and enhancing the accessibility of e-government services, all of which collectively aim to foster

greater social inclusion and economic participation (Dlodlo, 2022). These efforts are crucial in creating an enabling environment that supports digital innovation while ensuring the benefits of technological advancements are accessible to all segments of society. Research by Deichmann, Goyal, and Mishra (2019) highlights the importance of governmental policy coherence and regulatory frameworks in promoting digital inclusivity and highlights the positive impact of public investments in digital infrastructure on economic growth and social development.

Conversely, from a private sector perspective, stakeholders play a pivotal role in driving innovation and service provision, which are essential for extending digital access and services to marginalized communities. Private entities are instrumental in developing and deploying new technologies, creating digital platforms, and providing the necessary services that facilitate digital inclusion. Public-private partnerships (PPPs) are particularly significant in this context, as they allow for the pooling of resources, expertise, and infrastructure, thereby enhancing the reach and effectiveness of digital initiatives. Private sector contributions are critical for addressing gaps in digital infrastructure and services that public investments alone may not fully cover (ICT Sector Council, 2021). However, profitability concerns in less economically viable regions continue to hinder the comprehensive deployment of digital infrastructure. Studies such as those by Aker and Mbiti (2021) highlight the challenges faced by private enterprises in investing in underserved areas, citing high costs and low returns on investment as significant barriers.

The collaboration between the public and private sectors is essential for creating a more digitally inclusive economy. The government provides the regulatory and policy framework necessary for fostering a conducive environment for digital innovation, while the private sector brings in technological expertise and investment to drive these initiatives forward. This symbiotic relationship ensures that digital transformation efforts are sustainable and inclusive, addressing both the technological and socio-economic aspects of the digital divide (Büchi, Just, & Latzer, 2019). Successful examples of such collaborations can be found in various international contexts, where coordinated efforts between governments and private firms have significantly reduced digital exclusion and enhanced economic participation (Van Deursen & Helsper, 2021).

South Africa's Digital Transformation Strategy 2020-2030 highlights the critical roles of both the public and private sectors in promoting digital equity and inclusive economic growth. By focusing on infrastructure development, digital skills training, and expanding e-government services, the strategy aims to establish a foundation for widespread digital inclusion. Effective policy coherence, robust regulatory frameworks, and public investments from the government, coupled with innovation and service provision from the private sector, are key to bridging digital divides and ensuring that all citizens can benefit from the opportunities presented by digital technologies. Continued research and evaluation of these initiatives are necessary to refine approaches and maximize the impact of digital transformation on social and economic inclusivity (Büchi et al., 2019; Aker & Mbiti, 2021).

2.4. Legislation and Regulations for Broadband Expansion

Various legislative initiatives across the globe, including regulatory reforms aimed at fostering competition, reducing costs, and incentivizing broadband infrastructure deployment in rural and underserved areas, have shown mixed results in terms of effectiveness and sustainability (Communications Authority of South Africa, 2020). From a public sector perspective, regulatory bodies play a crucial role in overseeing spectrum allocation and licensing, which are essential for facilitating competitive markets and ensuring equitable access to digital services (Dlodlo, 2022). These regulatory efforts are designed to create an environment where multiple service providers can operate, potentially lowering costs and improving service quality through competition. Conversely, the private sector emphasizes the importance of a supportive regulatory environment that enables collaborative ventures and addresses the financial viability of broadband rollout, particularly in less profitable rural regions (ICT Sector Council, 2021).

National implementations, such as those observed in South Africa, highlight the diverse approaches to achieving digital equity through the combined efforts of both public and private sectors. Government-led initiatives, including policies and investments in digital infrastructure and skills training, are aimed at reducing inequalities between rural and urban areas, thereby promoting more inclusive digital access (Dlodlo, 2022). On the other hand, private sector contributions are equally significant, with telecom companies and other private entities driving investments, fostering innovations, and forming partnerships to expand digital access despite

facing operational challenges (ICT Sector Council, 2021). This dual approach highlights the importance of cooperation between public and private sectors to effectively address the digital divide. However, the success of such initiatives often hinges on the alignment of regulatory frameworks with market realities and the ongoing commitment of stakeholders to adapt to changing technological and socio-economic landscapes. For example, studies have shown that without continuous monitoring and adjustments, even well-intentioned policies can fall short of their goals (Gillwald, 2019; Lembani et al., 2020). Thus, a balanced, context-specific, and flexible legislative approach is crucial for achieving long-term digital equity.

2.5. Theoretical Framework

The Diffusion of Innovations (DOI) Theory, proposed by Everett Rogers in 2003, provides a comprehensive framework for understanding how innovations spread through populations and the factors that influence their adoption. DOI Theory identifies five key attributes of innovations that affect their rate of adoption: relative advantage, compatibility, complexity, trialability, and observability. These attributes are crucial in the context of digital adoption, particularly in marginalized communities where access to infrastructure, digital literacy, and high-quality content are significant barriers.

Access to Infrastructure

Access to infrastructure, including affordable and reliable internet connectivity, is a foundational requirement for the diffusion of digital innovations. DOI Theory posits that the relative advantage of an innovation, or the degree to which it is perceived as better than the idea it supersedes, is a critical factor in its adoption (Rogers, 2003). However, in communities lacking adequate infrastructure, the potential advantages of digital technologies are often inaccessible, hindering their adoption. Infrastructure access directly influences the compatibility and complexity attributes of innovations. Innovations that require high-speed internet or advanced digital devices may not be compatible with the realities of underserved communities, where such resources are scarce. This lack of compatibility leads to increased perceived complexity, as users may struggle with technologies that are not supported by their existing infrastructure. Van Dijk (2020) highlights that marginalized communities often face systemic barriers in accessing digital infrastructure, which exacerbates the digital divide and impedes the diffusion of innovations.

Cost is another significant barrier to digital adoption, particularly in low-income communities. DOI Theory suggests that the perceived relative advantage of an innovation must outweigh its costs for it to be adopted (Rogers, 2003). When digital technologies are prohibitively expensive, their relative advantage is diminished, and adoption rates decline. Financial constraints also impact the trialability of innovations, or the degree to which they can be experimented with on a limited basis. High costs often prevent individuals from trying new technologies, thereby hindering their diffusion. Implementing trial or pilot programmes that allow communities to experience digital technologies at a reduced cost or for free can help overcome this barrier. By reducing financial risk, these programmes align with DOI Theory's emphasis on trialability and build trust among potential adopters (Rogers, 2003).

To address these challenges, policymakers and developers must focus on improving infrastructure in underserved areas, ensuring that innovations are compatible with the available resources. This approach aligns with DOI Theory's emphasis on the importance of fitting innovations within the existing social and technological frameworks of a community (Rogers, 2003).

Digital Literacy

Digital literacy, or the ability to effectively use digital tools and technologies, is another critical factor in the diffusion of digital innovations. DOI Theory's focus on complexity is particularly relevant here. Innovations perceived as difficult to understand or use are less likely to be adopted (Rogers, 2003). In communities with low levels of digital literacy, the complexity of new technologies can be a significant barrier to adoption. Educational disparities often result in limited digital literacy, which prevents users from fully realizing the relative advantages of digital innovations (Van Dijk, 2020). To overcome this, targeted educational programmes and training initiatives are essential. These programmes should aim to simplify the use of digital technologies, thereby reducing their perceived complexity and making them more accessible to a broader audience. Moreover, the implementation of user-friendly designs and comprehensive support systems can further mitigate the complexity barrier. Van Deursen and Van Dijk (2021) argue that simplifying technology interfaces and providing accessible training can significantly enhance the adoption of digital innovations, particularly in communities with

limited digital literacy. This strategy not only aligns with DOI Theory's emphasis on reducing complexity but also supports Equity Theory's focus on fairness in access to technology.

High-Quality Content

The availability of high-quality digital content is essential for the successful diffusion of digital innovations. According to DOI Theory, the observability of an innovation, or the extent to which its results are visible to others, plays a crucial role in its adoption (Rogers, 2003). High-quality content enhances the observability of digital technologies by providing tangible examples of their benefits, which can motivate potential adopters. In marginalized communities, the lack of high-quality, relevant content can deter the adoption of digital technologies. If the available content does not meet the specific needs and interests of these communities, the perceived relative advantage of digital innovations diminishes, reducing their likelihood of adoption (Van Dijk, 2020). Therefore, content creators and developers must focus on producing content that is not only high-quality but also tailored to the cultural and social contexts of the target audience. This approach aligns with the compatibility attribute in DOI Theory. Content that resonates with the values, language, and needs of a community is more likely to be adopted, as it fits seamlessly into the existing cultural framework (Rogers, 2003). Furthermore, showcasing the positive outcomes of using high-quality content through case studies and success stories can enhance the observability of digital innovations, further encouraging their adoption (Warschauer & Matuchniak, 2010).

Strategic Recommendations for Advancing Digital Equity

To facilitate the widespread adoption of digital innovations and promote digital equity, a multifaceted approach is required. This approach should incorporate principles from both DOI Theory and Equity Theory, emphasizing the importance of fairness in access to technology and the need to address systemic barriers. Improving Infrastructure: Investments in digital infrastructure are crucial to making digital innovations accessible and compatible with the needs of marginalized communities. This step is fundamental to enhancing the relative advantage and reducing the complexity of digital technologies. Enhancing Digital Literacy: Providing targeted training and educational programmes can reduce the perceived complexity of digital innovations, making them more accessible to individuals with varying levels of digital literacy. Creating High-Quality, Relevant Content: Developing content that is culturally and

socially relevant to marginalized communities can enhance the compatibility and observability of digital innovations, making them more appealing and likely to be adopted. Offering Financial Support and Trial Programmes: Reducing the cost barriers to digital adoption through subsidies, discounts, and trial programmes can increase the trialability of innovations, allowing more individuals to experience their benefits. Promoting Success Stories: Highlighting visible success stories and positive outcomes of digital adoption can enhance the observability of innovations and motivate others to adopt similar technologies. By addressing the key factors of access to infrastructure, digital literacy, and high-quality content through the lens of DOI Theory, stakeholders can promote a more equitable diffusion of digital innovations, ensuring that the benefits of these technologies are accessible to all communities

2.6. Empirical Literature Review

Literature and Concepts

Digital redlining is a pervasive issue characterised by the systematic denial of access to digital technologies and resources to specific communities, often rooted in historical and socio-economic disparities. This phenomenon stems from similar discriminatory practices as traditional redlining, where services such as housing and banking were withheld from certain neighbourhoods, typically communities of colour. Digital redlining manifests in various ways, including limited access to high-speed internet, inadequate technological infrastructure, and a lack of digital literacy programmes, all of which contribute to a widening digital divide.

Three primary factors play a critical role in perpetuating digital redlining: Digital Access, Digital Literacy, and the availability of High-Quality Content.

Digital Access

This refers to the fundamental ability of individuals and communities to connect to digital infrastructure, including the internet and necessary hardware. Without this access, entire populations are excluded from the digital economy, educational opportunities, and essential online services. The lack of digital access is often a result of inadequate investment in infrastructure in marginalised communities, leading to a digital divide that mirrors existing socio-economic inequalities (Office of Educational Technology, 2024).

The cost of technology remains a significant barrier to adoption, further perpetuating the digital divide. High costs associated with purchasing devices, maintaining internet service, and accessing premium content or software can exclude low-income communities from the digital realm. This economic barrier underlines the importance of addressing financial inequities as part of a broader strategy to combat digital redlining

Digital Literacy

Beyond access, digital literacy is crucial for individuals to effectively use and navigate digital technologies. Digital literacy encompasses a range of skills, from basic internet navigation to more advanced competencies like understanding online privacy or using digital tools for professional development. Inequities in digital literacy further exacerbate the marginalisation of communities already affected by digital redlining, as they are less able to benefit from the digital resources that are available to them (Office of Educational Technology, 2024).

High-Quality Content

Access to high-quality, relevant content is also essential for meaningful participation in the digital world. Communities affected by digital redlining often have less access to such content, which limits their ability to benefit from educational and economic opportunities online. The availability of content that is not only accessible but also culturally relevant and engaging is vital for addressing the disparities caused by digital redlining.

To effectively address digital redlining, a comprehensive approach is necessary. This approach must include ensuring universal access to digital infrastructure, implementing widespread digital literacy programmes, and removing financial barriers that hinder technology adoption. By tackling these factors holistically, policymakers and stakeholders can work towards closing the digital divide and fostering equitable access to digital resources for all communities.

Digital equity refers to the principle of ensuring that all individuals have equal access to digital tools, resources, and opportunities, regardless of their socio-economic status, geographic location, or personal abilities. It encompasses access to digital infrastructure, the skills needed to effectively use technology, and the availability of high-quality content. Achieving digital

equity is crucial as it underpins equal participation in the digital economy and society, supporting improved educational outcomes, job opportunities, and social inclusion.

2.6.1. To Investigate Access to Digital Infrastructure

Access to digital infrastructure in South Africa is a multifaceted issue shaped by a complex interplay of socio-economic, geographical, policy-related, and cultural factors. The inequalities in digital access have profound implications for economic development, social equity, and overall digital inclusion.

The challenge of infrastructure development, particularly in the remote and mountainous regions of South Africa, further complicates efforts to enhance digital access. The deployment of broadband cables and the establishment of cellular networks in these areas are often cost-prohibitive and complex, leading to significant delays in infrastructure rollout (Mutula, 2020). Moreover, the neglect of maintenance for existing infrastructure compounds these issues, resulting in unreliable digital services for rural communities. This highlights the need for comprehensive infrastructure strategies that prioritize both the deployment and maintenance of digital networks to support sustained digital literacy initiatives.

Ensuring universal access to reliable internet connections and necessary devices is critical for bridging the digital divide. Kloza (2023) emphasizes the need for robust investments in digital literacy programmes that empower individuals to effectively navigate and utilize technology. Digital literacy, defined as the ability to use digital technologies, communication tools, and networks to access and manage information, is essential for fostering a digitally inclusive society (Loução, 2023). Addressing both infrastructure and educational gaps is therefore crucial in creating a more inclusive and digitally literate population.

The digital divide, particularly its impact on inclusion and exclusion from the digital world, is a pressing concern in South Africa. Stark in in internet access exist, with approximately 54% of urban households connected to the internet compared to only 8.7% of rural households (Iberdrola, 2024). This divide is largely driven by the high cost of data, which remains a significant barrier despite the decreasing cost of digital devices (Chinembiri, 2020). To mitigate these disparities, the Independent Communications Authority of South Africa (ICASA) has

implemented the 'End-User and Subscribers Service Charter' regulations, which include relief measures such as a 'transformation fund' to support universal services in underserved areas. These regulations aim to reduce digital inequality by improving access to digital resources in disadvantaged communities.

Schools and libraries play a critical role as primary 'community access centres' for internet connectivity, fostering societal development and promoting equality by providing access to information and communication technology services. However, the increasing shift of essential services online, such as job-seeking and applying for state grants, raises concerns about exacerbating disadvantages for those without internet access. The limited ability of some citizens to critically engage with rapidly evolving information and communication technologies further complicates efforts to achieve digital inclusion, posing challenges for present and future generations (Seuyong et al., 2023; Kotze, 2020; Mulyaningsih et al., 2020). These challenges stress the complex dynamics of digital inequality and its broader implications for societal development and access to information.

2.6.1.1. To Investigate the Role of Digital Literacy

Education and digital literacy are pivotal in determining access to and utilization of digital infrastructure, with profound implications for societal inclusion. Van Deursen and Van Dijk (2019) emphasize that individuals with higher education levels tend to possess the skills necessary to effectively engage with digital technologies. In South Africa, disparities in educational attainment exacerbate unequal access to digital infrastructure, particularly in rural areas where digital literacy levels are significantly lower (Kleine, 2020). This inequality underscores the critical need for targeted educational interventions to bridge the digital divide and ensure equitable access to digital resources.

In today's rapidly evolving technological landscape, many individuals struggle to keep pace, a challenge compounded by insufficient knowledge of how to operate and utilize digital devices (Questia.com, 2014). Digital literacy, which Nkwenti (2014) defines as the ability to proficiently use computer-based technology and other digital tools in personal and professional contexts, is crucial for overcoming this challenge. The emphasis on technical skills and technology-related knowledge highlights the essential role digital literacy plays in enabling

individuals to participate fully in modern society (National Institute of Adult Continuing Education, 2013).

However, the absence of digital literacy contributes to a widening digital divide, particularly in developing countries where access to technology and technical education is limited (Questia.com, 2014). Harris (2010) notes that digital literacy is not an innate skill but one that requires continuous exposure to various technological platforms. This insight suggests that digital literacy education must be ongoing and adaptable to new technological developments to remain effective.

Donovan (2011) expands on the importance of digital literacy by outlining three core objectives for learners: building confidence in using digital tools, fostering critical thinking, and facilitating identity shifts. These objectives highlight the transformative potential of digital literacy, enabling individuals to perform tasks more effectively and adapt to diverse informational environments. Moreover, Donovan (2011) argues that digital literacy extends beyond mere technical proficiency; it encompasses the ability to think critically and creatively within digital spaces.

The integration of technology and multimedia into educational settings has not only streamlined traditional processes but also fostered creativity and innovation (Questia.com, 2014). This evolution of digital literacy is evident in the growing focus on online and web literacy, where users combine digital skills with critical thinking to create high-quality content for global audiences (Questia.com, 2014). Despite its importance, Walker (2011) points out that digital literacy is often implicitly embedded within existing curricula rather than being explicitly taught. He advocates for a more deliberate integration of digital literacy principles across various fields of study to ensure comprehensive learning and skill development.

Embedding digital literacy into educational programs is essential for preparing students to succeed in a global society that increasingly relies on technology for communication, collaboration, and problem-solving (Van Laar et al., 2017). By integrating digital literacy across different subjects, students can apply their skills in real-world contexts, enhancing their ability to navigate the demands of the 21st-century workforce (Thomas & Trudi, 2014). This

approach not only prepares students for future challenges but also ensures that they can adapt to the continuously evolving digital landscape.

Moreover, developing essential skills such as critical thinking, creativity, communication, and collaboration is vital for students to thrive in an ever-changing digital world (Les, 2015). Incorporating real-world projects and hands-on experiences into the curriculum provides students with practical skills that will benefit them academically and in their future careers (Falloon, 2020). This focus on skills development is crucial, as it equips students with the resourcefulness and adaptability needed to solve complex problems in a digital environment

2.6.1.2. To Investigate the Role of Information Availability

Demand for High-Quality Content

In recent years, there has been a growing demand in South Africa for high-quality content that meets international standards. This demand is driven by the increasing globalization of media and the desire for local content to compete on a global stage. Van et al. (2011) argue that providing training opportunities focused on producing such content can significantly enhance the skills of individuals working in the media and entertainment industries. Empirical evidence supports the notion that investment in quality education and training not only improves the competency of the workforce but also leads to greater success in the global market. For instance, a study by Thussu (2016) highlights the correlation between advanced training programmes in media production and the international success of content produced in countries like South Korea and India. Applying these insights to South Africa suggests that similar investments could position the country as a competitive player in the global media landscape.

However, challenges remain in the implementation of such training programmes. South Africa's education and training infrastructure in the media sector have historically been under-resourced, which has limited the scope and effectiveness of such initiatives (Chasi & De Wet, 2018). While efforts have been made to address these gaps, including partnerships with international media organizations, the pace of change has been slow. Furthermore, the high costs associated with these programmes can be prohibitive for many individuals, particularly those from disadvantaged backgrounds, thereby perpetuating existing inequalities in the

industry. Therefore, while the potential benefits of high-quality content production are clear, the accessibility and inclusivity of training programmes must be improved to ensure that all aspiring media professionals can participate in and contribute to the industry's growth.

Elevating South Africa's International Reputation

The production of high-quality, globally competitive content has the potential to elevate South Africa's reputation on the international stage. When South African content meets global standards while maintaining cultural relevance, it can attract a broader audience and open up new opportunities for collaboration with international companies. This is evidenced by the success of South African productions like *Tsotsi*, which won an Academy Award for Best Foreign Language Film, and the internationally acclaimed series *Blood & Water*, which has been streamed globally on platforms like Netflix (Barnard, 2019). Such successes underscore the potential for South African content to resonate with global audiences and highlight the country's cultural richness.

Nonetheless, maintaining this balance between global appeal and cultural authenticity can be challenging. As Oosthuizen (2017) notes, there is a risk that in striving to meet international standards, content producers may dilute or compromise the cultural specificity that distinguishes South African media. This could lead to a homogenization of content that prioritizes global marketability over local significance, potentially eroding the very cultural diversity that international audiences find appealing. Thus, while the pursuit of high-quality content is crucial for global competitiveness, it must be carefully managed to preserve the unique cultural narratives that give South African content its distinct identity.

Content diversity plays a crucial role in showcasing South Africa's rich history, traditions, and unique perspectives to a global audience. Alec (2008) suggests that by promoting a wide range of voices and stories, South Africa can position itself as a leader in the global media industry, particularly in promoting diversity and inclusivity. Empirical studies, such as those by Sison (2018), indicate that media diversity not only enhances the richness of the cultural narrative but also contributes to social cohesion by providing representation to historically marginalized groups. This diversity attracts international attention and investment, as global audiences increasingly demand content that reflects a wide array of experiences and perspectives.

However, achieving true content diversity in South Africa remains a challenge. The media industry has been criticized for perpetuating stereotypes and failing to adequately represent the country's diverse population (Gordon et al., 2001). For example, Moyo (2019) highlights the underrepresentation of certain ethnic groups and rural communities in mainstream media, which can lead to a skewed portrayal of South African society. Furthermore, there is often a commercial incentive to produce content that appeals to the largest possible audience, which can lead to the marginalization of niche voices and stories that do not fit the dominant narrative. To truly harness the power of content diversity, the industry must actively seek out and support underrepresented voices, ensuring that the full spectrum of South African life is reflected in the media landscape.

Promoting content that resonates with local communities is not only important for cultural representation but also for social cohesion. Lynn (2012) argues that by showcasing stories that reflect the experiences and values of local communities, South African media can foster a sense of pride and identity among its citizens. This is particularly important in a country with a history of division and inequality, where media representation can play a key role in promoting inclusivity and social justice. Studies such as those by Wasserman (2020) demonstrate that local content that accurately reflects the experiences of marginalized communities can empower these groups, giving them a voice in the national narrative and fostering a more inclusive society.

However, there are significant barriers to achieving this level of local relevance. The commercialization of the media industry often prioritizes content with mass appeal over niche, community-focused narratives. This can lead to the marginalization of local stories in favour of more universally appealing content. Additionally, the centralization of media production in urban areas means that rural communities, which often have unique and culturally rich narratives, are underrepresented in the national media landscape (Rodny-Gumede, 2020). Addressing these challenges requires a concerted effort to decentralize media production and ensure that local voices are given the platform they deserve.

2.6.1.3. To Examine the Relationship Between Access to Digital Infrastructure and Digital Equity

Insufficient digital infrastructure worsens existing inequalities by restricting access to essential digital resources. Warschauer (2022) points out that marginalised communities, including those in low-income and rural areas, face significant challenges when infrastructure is lacking. For instance, unreliable internet access can severely limit opportunities for online education, which is increasingly vital for academic success. Zickuhr and Smith (2022) demonstrate that these barriers create a cycle of disadvantage, where individuals without digital tools struggle to secure employment and access government services online.

Empirical studies support these observations. Hargittai and Marwick (2020) found that digital disparities are exacerbated in areas with inadequate infrastructure, where individuals often experience lower educational and employment outcomes compared to their better-connected counterparts. This gap is particularly pronounced in rural and low-income urban areas, where limited access to high-speed internet and digital devices deepens existing social and economic divides.

Conversely, advancements in digital infrastructure have been shown to positively impact digital equity. Anderson and Rainie (2022) provide evidence that efforts to expand broadband access in underserved areas can lead to notable improvements in educational outcomes and economic opportunities. For example, initiatives that increase broadband availability in rural regions are associated with better school performance and improved job prospects for residents.

The benefits of improved infrastructure are supported by empirical evidence. The International Telecommunication Union (2023) reported that broadband expansion in developing regions increased access to online educational and business resources. Additionally, data from the Pew Research Centre (2023) indicates that expanded broadband access correlates with greater civic engagement and improved access to government services, further illustrating the positive impact of enhanced digital infrastructure on digital equity.

Nonetheless, progress is uneven across different regions. Despite advancements, significant disparities in access persist. The European Commission (2024) notes that while some areas

have seen improvements, notable gaps remain in digital access and utilisation. This highlights the need for ongoing targeted efforts to address these persistent disparities.

Addressing digital inequities requires targeted policies that tackle the root causes of disparity. The International Telecommunication Union (2023) suggests several measures, including expanding infrastructure in underserved areas, providing subsidies for digital devices to low-income families, and offering digital literacy training. These strategies aim to ensure that improvements in digital infrastructure benefit all communities equitably.

The European Commission's Digital Strategy (2024) further emphasises the necessity for inclusive infrastructure investments. It advocates for policies that ensure digital infrastructure development meets the needs of all communities, particularly those historically underserved. This includes targeted investments in digital literacy programmes to help individuals fully leverage available resources.

Therefore, there is a critical link between access to digital infrastructure and digital equity. Inadequate infrastructure exacerbates inequalities by limiting access to education, employment, and services, while improvements in infrastructure can promote digital inclusivity and provide significant benefits to disadvantaged groups.

2.6.1.4. To Examine the Relationship Between Digital Literacy and Digital Equity

The relationship between digital literacy and digital equity is pivotal in discussions aimed at bridging the digital divide. Digital literacy is a foundational element for achieving digital equity, as it equips individuals with essential skills to effectively access and use digital technologies. Van Deursen and Van Dijk (2014) assert that digital literacy empowers individuals to engage with information, participate in digital platforms, and integrate into the digital economy. Without digital literacy, individuals may struggle to harness the full potential of digital technologies, which can worsen social inequalities. This perspective views digital literacy not just as beneficial but as critical for realising digital equity, especially concerning economic participation and information access.

Martin and Grudziecki (2006) further broaden this relationship by highlighting that digital literacy includes a wide range of skills, such as critical thinking, content creation, and ethical

use of technology. This comprehensive view suggests that digital literacy can significantly benefit marginalised groups by equipping them with the necessary tools to navigate digital spaces effectively. Consequently, digital literacy is regarded as a key step towards achieving digital equity, as it enables individuals to use digital resources to improve their socio-economic conditions.

However, literature also identifies notable challenges in translating digital literacy into digital equity. Warschauer (2003) argues that while digital literacy is essential, it alone cannot bridge the digital divide. He emphasises that underlying socio-economic issues such as access to technology, quality education, and economic resources must be addressed. Without tackling these fundamental issues, efforts to improve digital literacy may not result in substantial digital equity, as the structural barriers to access and participation persist.

Robinson et al. (2015) build on this critique by noting that digital literacy programmes often fail to reach the most disadvantaged groups those who would benefit most from such skills. They argue that many digital literacy initiatives assume a baseline level of access to technology, which is not always present. This assumption can limit the effectiveness of these programmes in promoting digital equity, as individuals lacking access to technology are often excluded from these opportunities.

While digital literacy is crucial for achieving digital equity, it cannot accomplish this goal alone. Selwyn (2004) argues that efforts to enhance digital literacy must be part of a broader strategy that also addresses socio-economic disparities and ensures equitable access to technology. This approach acknowledges that digital literacy and digital equity reinforce each other: improving digital literacy can contribute to digital equity, but only if it is supported by broader initiatives that address systemic inequalities.

2.6.1.5. To Examine the Relationship Between High Quality Content and Digital Equity

High-quality content is fundamental to bridging the digital divide, ensuring that information is accessible to users from diverse backgrounds. This relationship between high-quality content

and digital equity is crucial for understanding how well-designed content can mitigate disparities in digital access and literacy.

High-quality content with built-in accessibility features plays a significant role in promoting digital equity. Green and Taylor (2021) argue that content designed with features such as multilingual support and adaptive formats can significantly enhance information reachability for users with various needs. Empirical studies provide substantial evidence supporting this claim. For instance, Harris et al. (2024) show that educational materials offered in multiple languages and formats are more effective in supporting users with different linguistic backgrounds and disabilities. Their research, which involved a diverse participant pool, demonstrated that accessibility features in digital content notably improved user engagement and learning outcomes.

Chen (2023) further highlights that high-quality, interactive content contributes to digital literacy, a key component of digital equity. Chen's longitudinal study found that engaging educational content aids users in developing essential digital skills, enabling them to navigate and utilise digital resources more effectively. This underscores that providing access to technology alone is insufficient; the quality of the content users engage with is also critical in fostering digital equity.

Despite the clear benefits, several challenges impede the effective creation and dissemination of high-quality content. O'Connor and Miller (2023) identify that disparities in content quality often reflect broader socio-economic inequalities. Their research reveals that underserved communities frequently lack access to high-quality educational resources, which exacerbates existing disparities. This finding is supported by Nguyen (2022), who notes that marginalised communities face significant barriers to accessing well-produced content, thereby limiting their opportunities for digital advancement.

Moreover, ensuring that content is genuinely accessible involves addressing various barriers, including language, literacy, and technological constraints. Martin and Lewis (2021) found that content creators often struggle to meet diverse user needs due to these limitations. Their study indicates that, although many content providers attempt to address accessibility issues,

inconsistencies and gaps remain, particularly in underserved areas. This highlights the need for ongoing efforts to adapt content to diverse user needs effectively.

Patel and Sweeney (2024) stress the importance of inclusivity in content design. Their research shows that content that does not cater to diverse user needs often fails to support digital equity effectively. Their findings suggest that content creators must prioritise inclusivity and continuously adapt their materials to meet the evolving needs of varied user groups.

This reveals a complex relationship between high-quality content and digital equity. High-quality content enhances accessibility and digital literacy, playing a crucial role in bridging the digital divide. However, challenges such as socio-economic disparities and barriers to accessibility persist, which can undermine efforts to achieve digital equity. Addressing these challenges requires a concerted effort to ensure that content is both high-quality and inclusive, meeting the diverse needs of all users. Future research should focus on developing strategies to overcome these barriers and ensure that high-quality content effectively supports digital equity.

2.7. Conceptual Framework

The conceptual framework (Figure 2)is for shaping policies and programmes that foster universal access to digital technologies and promote equitable participation in the digital sphere. By integrating the foundational elements of digital access, literacy, and cost, stakeholders can address the multifaceted nature of digital equity and work towards inclusive digital environments.

The foundation of digital access encompasses various components, including affordable hardware and reliable software. Initiatives such as researching cost-effective availability, promoting open-source alternatives, and implementing digital literacy programmes contribute to enhancing digital access. Additionally, efforts to address hidden costs and ensure affordability are essential for equitable digital participation.

Digital literacy is another crucial aspect highlighted within the framework, encompassing basic digital skills, information literacy, media literacy, and technical literacy. These competencies empower individuals to effectively navigate the digital landscape, critically evaluate information, and engage with digital content meaningfully. Furthermore, the development of

high-quality digital content is vital for promoting engagement and relevance. Content creators must prioritize relevance, accuracy, interactivity, and multimodality to cater to diverse learning preferences and accessibility needs.

Digital equity enablers, such as equal access policies, inclusive representation, and community initiatives, play a pivotal role in closing the digital divide and fostering inclusion. Collaboration between government, private sector, and non-profit organizations is essential for driving community-driven efforts and raising awareness about digital equity issues. The interconnectedness of digital access, literacy, and cost highlights the holistic impact of interventions. Improvements in one area positively influence others, contributing to the overall quality of digital content and promoting equitable participation.

The integrated conceptual framework for digital equity provides a comprehensive roadmap for stakeholders to address the complexities of digital inclusion. By prioritizing universal access, enhancing digital literacy, and promoting high-quality content development, policymakers and educators can advance equitable participation in the digital age. Continuous feedback mechanisms ensure ongoing adaptation to evolving needs, ensuring the relevance and effectiveness of initiatives in fostering inclusive digital environments

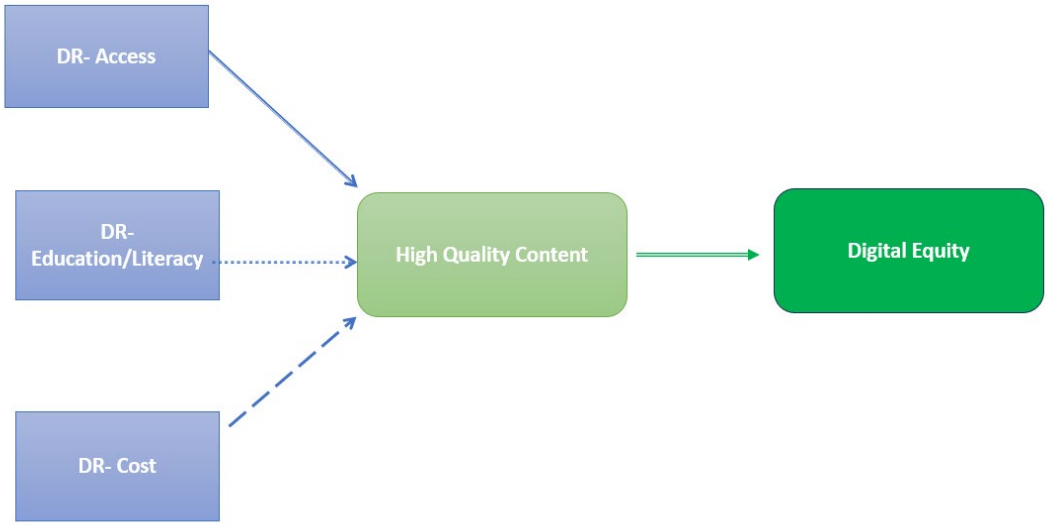


Figure 2: Conceptual Framework

This study discusses the concept of digital equity, which goes beyond just access to technology but also includes the ability to effectively use it. Students who have access to technology but

lack the skills may perceive educational experiences as unjust compared to their peers who have both access and skills. The framework of Digital Equity and Equity Theory is used to understand the digital divide, and it emphasizes the need for a comprehensive approach involving access, skills, and policy initiatives to ensure fairness and equal opportunities for all. The literature review provides a background on this topic and sets the stage for further exploration of conceptual frameworks and hypotheses related to digital equity

2.8. Key Knowledge Gaps

Digital redlining, characterized by inequalitiein digital technology access and services, continues to present significant challenges to achieving digital equity in South Africa. This analysis identifies critical knowledge gaps in current research, focusing on methodologies, data availability, findings, and conclusions from existing studies and evaluations of the issue. Research methodologies applied in studying digital redlining vary, encompassing qualitative and quantitative approaches; however, a notable gap exists in comprehensive longitudinal studies tracking changes in internet access and digital literacy over time, particularly in underserved rural communities (Masenya & Ngulube, 2020). Longitudinal studies are essential to assessing the effectiveness of policy interventions and private sector initiatives, providing a clearer understanding of trends and inequalitiein digital infrastructure development.

Data availability and utilization pose additional challenges. While some studies utilize national surveys and administrative data from organizations like the Universal Service and Access Agency of South Africa (USAASA), these sources often lack granularity in describing specific barriers faced by marginalized communities in accessing the internet and developing digital skills (Gstrein & Kochenov, 2020). Moreover, there is insufficient data on the socioeconomic impacts of digital redlining, such as its effects on employment and education across different regions.

Existing studies highlight the unequal distribution of internet infrastructure between urban and rural areas as a primary driver of digital redlining in South Africa (Paul et al., 2015). Yet, empirical evidence on the effectiveness of interventions such as community telecentres and subsidized internet programmes in narrowing the digital divide remains sparse (Sthembiso

Msomi & Muzombo Kandolo, 2023). More rigorous evaluations are necessary to assess the outcomes of these initiatives and their scalability in diverse socio-economic contexts.

2.9. Conclusion

To effectively address digital redlining and improvement towards digital equity, the literature suggests several key recommendations. Firstly, it is essential that legislation is tailored to the socio-economic and cultural contexts of the regions they are intended to serve (Gillwald, 2019). This context-specific approach ensures that policies are relevant and effective in addressing local needs. Secondly, policies must adopt a holistic approach, focusing not only on access but also on digital literacy, affordability, and the broader socio-economic factors contributing to digital inequity (Mossberger, Tolbert, & Stansbury, 2003). This comprehensive strategy is critical in tackling the multifaceted nature of digital redlining. Thirdly, international collaboration and funding are paramount to support the development of digital infrastructure and education, particularly in developing countries (ITU, 2021). Such global cooperation can help bridge the digital divide on a larger scale. Lastly, the effectiveness of these policies depends significantly on robust implementation and regular monitoring to ensure they achieve their intended objectives (Lembani et al., 2020). Consistent evaluation and adjustment of policies are necessary to maintain their relevance and efficacy in combating digital redlining.

The conclusion drawn from current research highlights the systemic nature of digital exclusion in South Africa, yet consensus is lacking on the balance between personal responsibility and systemic interventions in addressing digital redlining (Sanders & Scanlon, 2021). While policy reforms and increased investments in digital infrastructure are often recommended, there is a need for studies evaluating the unintended consequences of technology-centric solutions on broader social equity (Dwivedi et al., 2023).

3. CHAPTER 3. METHODOLOGY

3.1. Introduction

This chapter identifies and describes research approach, design as well as procedure and methods that we employ in this research to collect, process, and analyse empirical evidence. Broadly, it has three objectives; namely, to identify and describe the research strategy (Section 3.2), the research design (Section 3.2), as well as the procedure and methods (Section 3.3). The chapter also describes the reliability and validity measures (Section 3.4) that this research applies to make it credible as well as the technical and administrative limitations of the choices we make (Section 3.5).

3.2. Research Strategy

A research strategy serves as a structured framework employed to systematically collect, analyse, and interpret data to understand correlations, variables, or phenomena. This methodological framework encompasses qualitative, quantitative, and mixed-method approaches, each tailored to different research inquiries and concepts (Knipe & Mackenzie, 2006). The debate between qualitative and quantitative methodologies traces back to the early 1900s, where each approach underwent scrutiny against specific criteria for application. Newman and Ridenour's seminal paper in 1998 contributed significantly to this discourse. In chapter 1 we have outlined two crucial inquiries that this research report seeks to address' What factors contribute to digital redlining in South Africa? and To what extent does digital equity serve as a solution digital redlining in South Africa Subsequently, a comprehensive examination of existing literature in chapter 2 has been conducted, and an interpretative as well as conceptual framework has been developed to guide the selection of methodologies. Therefore, the qualitative methodology has been selected as the most appropriate research methodology for this study.

3.3. Research Design

Research design serves as a crucial framework for exploring research issues, including setting aims and objectives, determining data sources, and outlining data analysis procedures (Saunders, Lewis, & Thornhill, 2016). According to Bryman's (2012) taxonomy, there are five fundamental research strategies: longitudinal, comparative, cross-sectional, case study, and experimental, each designed to address distinct research inquiries. Based on the literature review, this study utilises a cross-sectional research approach, which is particularly suited for

studies that employ surveys or questionnaires at a specific point in time to analyse patterns of association and variations in certain variables (Bryman, 2012).

The choice of a cross-sectional strategy is supported by literature that emphasises its advantages in terms of validity, reliability, and replicability, especially when compared with other designs like longitudinal research (Rindfleisch, 2008). This study opts for a cross-sectional design due to its focus on specific factors without emphasising temporal aspects, while also acknowledging the potential benefits of longitudinal designs in certain contexts (Saunders, Lewis, & Thornhill, 2016).

The selection of a cross-sectional design aligns with the positivist quantitative research paradigm, which prioritises objective measurements, statistical analysis, and the pursuit of empirical evidence. By employing random sampling techniques, the study ensures that samples are representative, enabling findings to be generalised to the wider population. This generalisability provides valuable insights that can inform policymakers, organisations, and stakeholders in their efforts to address digital redlining and promote digital equity on a national scale

Quantitative research approaches encompass quasi-experimental, descriptive, correlational, and experimental methodologies, typically involving larger sample sizes to enhance representativeness (McCusker & Gunaydin, 2014). Widely employed in fields such as behavioural economics and decision sciences, these methods facilitate precise inquiry through the analysis and interpretation of data (Cropley, 2019). However, emerging methodologies like futures research challenge traditional quantitative approaches by introducing new perspectives and complexities.

Quantitative methodologies, rooted in a positivist paradigm, enable scientific testing of hypotheses, facilitating the investigation of research questions by identifying variations in individual variables and establishing measurement standards based on participant differences. A notable example is Zeelenberg et al.'s study, which employed quantitative experiments to explore decision-making processes aimed at avoiding regret in risky situations. This study offers valuable insights into statistical methodologies, data collection tools, and appropriate

sample sizes. However, it is important for researchers to remain vigilant against biases that could affect study outcomes.

Quantitative research is distinct in its focus on quantifying aspects of subjects, organisations, and individuals, contrasting with qualitative approaches that explore the characteristics and nuances of phenomena. While qualitative methods provide depth and understanding of phenomena, quantitative approaches allow for the assessment and interpretation of data to address specific research questions (Saunders, Lewis, & Thornhill, 2016).

For example, Bornman (2016) used a quantitative approach to investigate the digital gap in South Africa. This study utilised Afrobarometer's questionnaire surveys to collect data on internet usage, mobile internet accessibility, gender disparities, and demographic differences. The data collected provided policymakers with insights into trends and gaps, enabling them to develop targeted strategies to promote digital inclusion and reduce inequalities. This approach underscores the relevance and impact of quantitative research in the broader discourse on information society integration and digital equity. Therefore, the quantitative research approach is particularly well-suited for studies concerning digital redlining and equity in South Africa. Its ability to collect, analyse, and generalise numerical data enables researchers to draw statistical inferences, identify trends, and comprehend the broader implications of digital inequalities within society.

It is important to acknowledge the limitations of relying solely on quantitative methods. To address these limitations, researchers should consider incorporating qualitative methods such as interviews or focus groups to gather firsthand accounts and perspectives from those affected by digital redlining (Choung & Manamela, 2018). Adopting a mixed-methods approach can enrich the study by providing a more comprehensive understanding of the complexities associated with digital equity challenges. Ultimately, the use of a positivist quantitative research paradigm, particularly through a cross-sectional design, aligns with the study's objectives. As demonstrated by Oyelaran-Oyeyinka and Adeya (2018), this approach enables the development of robust empirical evidence to address research questions and make a significant contribution to the discourse on digital redlining and equity.

3.4. Research Procedure and Methods

This section documents the actual procedure, and the methods employed in this research to collect, collate, process, and analyse empirical evidence. Broadly, we detail the data and information collection instruments (Section 3.4.1), the target population and sampling of respondents (Section 3.4.2), data and information collection process and storage (Section 3.4.3), data and information processing and analysis (Section 3.4.4) as well as the background description of the respondents who provided empirical evidence for this research study (Section 3.5). the ethical considerations during the research process (Section 3.7.)

3.4.1. Data Collection

Research data collection is a systematic process used by researchers to gather information to answer their research questions. The choice of data collection method depends on the study's nature, the information needed, and the research context. Effective data collection ensures the integrity of the findings (Taherdoost, 2021). There are four primary modes of research data collection: participant observation or ethnography, interviews (face-to-face, telephone, or internet-based), focus group discussions, and the examination of documents (Taherdoost, 2021). Participant observation allows researchers to immerse themselves in the study's natural environment, gain insights into social behaviours and cultural contexts, engage directly with participants, and explore shared perspectives and diverse opinions. Interviews provide flexibility in reaching geographically dispersed participants, while focus group discussions encourage interaction among participants. Documents, including existing records or archival materials, can be analysed to extract relevant information (Taherdoost, 2021).

This study primarily utilized a quantitative research approach to assess the relationship between digital infrastructure, skills development, and information availability in achieving digital equity. The main instrument for data collection was a structured questionnaire, designed to gather quantitative data from a large sample of participants. The questionnaire featured closed-ended questions and Likert scales to measure specific variables aligned with the research objectives, such as access to digital infrastructure, skills development, and information availability. Additionally, demographic questions were included to help identify patterns and correlations within the dataset.

The questionnaire was distributed electronically, allowing for a broad geographic reach and ensuring timely data collection. Responses were automatically recorded and organized for efficient statistical analysis, enabling the identification of trends, correlations, and potential causal relationships between the variables studied.

To complement the quantitative data, a limited number of semi-structured interviews were conducted to provide qualitative insights. However, the primary focus remained on the quantitative data, with qualitative findings used primarily to contextualize and interpret the statistical results.

3.4.2. Population and Sample

The target population for this study may include individuals from diverse demographic backgrounds, including different age groups, genders, races, ethnicities, and socioeconomic statuses. It would encompass both urban and rural areas of South Africa, as digital redlining can occur in both settings. Additionally, the target population may comprise individuals who face barriers to accessing digital resources and opportunities, such as limited internet access, lack of affordable devices, inadequate digital skills, or exclusion based on discriminatory practices. The target population is any person above the age of 18 years of age.

Sampling Procedure

Authors Saunder, Lewis, & Thornhill, (2016) state that probability sampling is used in quantitative research to ensure generalizability and is divided into five main strategies: simple random, systematic random, stratified random, cluster and multistage.

The choice of sampling procedure should be carefully considered, considering the research objectives, the representativeness of the sample, and the available resources. Probability sampling methods generally provide a higher level of representativeness and allow for statistical generalization to the broader population. However, non-probability sampling methods can be more feasible and practical in certain situations or when specific subgroups need to be targeted (Sheppard, 2020).

The stratified sampling method involves dividing the target population into distinct strata (e.g., urban, and rural areas, different income groups) and then randomly selecting participants from each stratum in proportion to their representation in the population. The justification for the

use of the stratified sampling method is to identify differences between participants based on attributes.

3.4.3. Collection Instruments

Methods for gathering research data include observations, questionnaires, interviews, and focus group discussions. The questionnaire approach will be used to collect data for this investigation. A questionnaire is a research tool used to collect information from individuals or groups of respondents. Standardization, efficiency, anonymity, cost-effectiveness, large-scale data collecting, quantitative analysis, and simplicity of administration are all advantages. Response bias, limited depth, a lack of clarity, non-response bias, inflexibility, and a lack of qualitative data are all disadvantages. To solve these drawbacks, minimize bias, and assure the validity and reliability of the obtained data, questionnaires must be carefully designed, and pilot tested (Einola & Alvesson, 2020)**.**

3.5. Data Analysis

The term "research data processing" pertains to the various procedures and operations involved in converting and scrutinising data for the purpose of detecting and discerning patterns, correlations, and deviations within the data. Moreover, it constitutes a fundamental element of the process of hypothesis testing (Goundar, 2019).

The present investigation involves the coding, cleaning, and computerised entry of data to adhere to the principles of quantitative research methodology. Data coding is a necessary process in situations where there exists semantic similarity among Variables. Another objective of coding is to guarantee the accessibility of data for subsequent analysis (Bryman, 2012).

To fulfil the research objectives, a survey instrument will be disseminated to the general population using the Qualtrics software. The questionnaire will be made available to participants through both desktop and mobile devices. After the collection of data through the use of a questionnaire, it will be subjected to coding procedures within a statistical software package, specifically SPSS. The process of cleaning the data will be executed using Microsoft Excel. The data processing techniques and subsequent analysis will be performed utilising the Statistical Package for the Social Sciences (SPSS). By using quantitative methods, researchers

can analyse numerical data to identify patterns, trends, and correlations, providing evidence to support or refute the hypothesis that digital equity can address digital redlining.

The engagement in descriptive analysis to perform descriptive statistics to summarize the data. Calculate measures such as mean, median, mode, standard deviation, and frequencies to gain a basic understanding of the distribution of Variables. This analysis can help identify initial patterns and trends in digital equity and digital redlining.

Vector Autoregression (VAR) analysis is a statistical technique that investigates the dynamic correlations and interdependence of many Variables across time. It enables researchers to understand how changes in one Variable may affect others in the system. VAR analysis can aid in the investigation of critical issues such as access, pricing, digital literacy, and high-quality content in the context of South African digital equity research. VAR allows for a thorough examination of the temporal dynamics and feedback processes, resulting in a more nuanced understanding of the changing landscape of digital inclusion. VAR analysis also identifies lead-lag correlations between Variables, indicating potential intervention areas. It also aids strategic planning by offering a comprehensive view of the interconnection of factors, allowing stakeholders to prioritise resources and efforts in areas with the greatest influence on promoting digital fairness.

Statistical significance to assess the statistical significance of your findings to determine if the observed relationships are likely to occur by chance. This involves calculating p-values and confidence intervals. Significance testing helps establish the validity and reliability of the results (Sheppard, 2020).

3.6. Validity and Reliability

To assess the internal consistency of measurement instruments, Cronbach's alpha coefficient (α) is employed. An α value exceeding 0.70 typically signifies that the scale items consistently measure the same construct, thereby ensuring data reliability and reproducibility (Nunnally & Bernstein, 1994). Additionally, test-retest reliability is assessed by administering the same instrument to the same sample at multiple time points to evaluate the stability of the results over time, thereby confirming temporal consistency (Guilford & Fruchter, 1973).

Internal validity is concerned with the degree to which measurement tools accurately assess the constructs they are intended to measure, free from the influence of extraneous variables. This involves meticulously defining constructs and employing validated instruments that have demonstrated their ability to measure the intended variables effectively (Campbell & Fiske, 1959). External validity, conversely, pertains to the generalizability of research findings beyond the specific study context. It necessitates the use of representative samples and careful consideration of the research environment to ascertain that results are applicable across different settings, populations, or time periods (Shadish, Cook, & Campbell, 2002). Exploratory Factor Analysis (EFA) is utilized to identify and validate latent constructs, ensuring that measurement tools accurately capture the intended dimensions of the constructs (Henson & Roberts, 2006).

Reliability refers to the consistency of measurement results across different examples of data collection, with high reliability indicating that the measurement produces stable outcomes (Reliability, 2003). Validity, on the other hand, is established when a measurement accurately reflects the intended construct without capturing unrelated factors (Messick, 1989). Ensuring both internal and external validity is crucial for obtaining credible and generalizable results. In this study, Cronbach's alpha (α) was employed to assess the internal consistency of the measurements, while EFA was utilized to identify and confirm

3.7. Ethical Considerations

3.7.1. Ensuring participants have given informed consent

Prior to recording any information, it is imperative that the respondents within the community grant their consent. This ensures that participants are fully aware of the research purpose and procedures and agree to partake voluntarily.

3.7.2. Ensuring no harm comes to participants

The researcher will take measures to prevent any deception or harm to the respondents, and to avoid any potential negative impact on their self-esteem. This includes safeguarding participants from any physical, emotional, or psychological distress.

3.7.3. Ensuring confidentiality and anonymity

Moreover, it is postulated that the data of all participants will be safeguarded, and their identities will not be disclosed in any manner and will persist incognito throughout the entire research procedure. Thus, the confidentiality of the participants' information will be ensured throughout the study.

3.7.4. Ensuring that permission is obtained

Before initiating the research, an ethics certificate was acquired from the Wits Business School. This process is conducted with a foundation of reverence for research participants, safeguarding of personal information confidentiality and data security, maintenance of anonymity, and avoidance of deceit.

3.7.5. Limitations of the research questionnaire

A research questionnaire can provide valuable insights into the study, but it has potential limitations such as response bias, limited depth of information, self-reported data, recall bias, and sample selection bias. These limitations can impact the accuracy and validity of the data collected.

4. CHAPTER 4. PRESENTATIONS OF RESULTS

4.1. Introduction

The primary objective of the section is a meticulous examination and analysis of the effects of digital redlining on digital equity within the unique socio-economic landscape of South Africa. The focus is on scrutinizing how digital redlining practices contribute to and exacerbate inequalitiein access to and utilization of digital resources across different demographic groups. By achieving this objective, the research endeavours to contribute valuable insights to the ongoing discourse on digital equity and inclusion. To provide a robust conceptual framework for the study, the researchers wholeheartedly embrace the Equity Theory, deeply rooted in the pursuit of fairness in social and economic interactions. In the South African context, characterized by a history of apartheid, digital equity transcends mere access to encompass fair and equal opportunities in utilizing digital resources. The Equity Theory becomes an indispensable tool in dissecting the intricate dynamics of digital access, exposing gaps in digital equity, and guiding efforts to bridge these disparities.

A comprehensive review of the current literature brings to light a significant gap in resources addressing digital redlining in South Africa. The lack of a thorough investigation into the causes and impacts of digital redlining impedes understanding of its influence on digital equity. This gap hampers the development of effective plans to address and correct existing discrepancies, emphasizing the need to bridge this research gap for targeted interventions that promote fair access and utilization of digital resources. The overarching aim is to investigate the factors of digital redlining in South Africa and explore potential solutions. The secondary question is namely “To what extent does digital equity serve as a solution digital redlining in South Africa” is supported by sub-questions further investigate the relationship between access to technology, cost, digital literacy, high-quality content, and applications, and their impact on digital equity. Each of the respective research questions is accompanied by their respective hypothesis. The last section of this provides conclusions to the answers for the questions stated above.

4.2. Profile of the respondents: Descriptive Statistics

Descriptive statistics, including measures such as mean, median, mode, range, Variance, and standard deviation, serve as valuable complements to VAR analysis. They facilitate the examination and communication of data Variability, so enabling researchers to make well-informed decisions in diverse domains.

Gender	**Frequency**	**Percent**
Binary	1	0,9
Female	70	64,2
Male	38	34,9
Total	**109**	**100,0**
Age	**Frequency**	**Percent**
18 – 24	37	33,9
25 – 34	30	27,5
35 – 44	24	22,0
45 – 54	11	10,1
55 and above	7	6,4
Total	**109**	**100,0**
Ethnicity	Frequency	Percent
Black African	106	97,2
Coloured	2	1,8
Indian	1	0,9
Total	**109**	**100,0**

Table 1: List of Participants

Table 1 above shows that 64,2% of the participants in the study were females followed by males with 34,9% and Binary (0,9%). Furthermore, most of the participants were a younger population (18 – 34 years) at 61,4% as compared to the older population (35 years and above) at 38,6%. In addition, of the 109 participants in the study, 97,2% were Black African followed by Coloured (1,8%) and Indian (0,9%).

Education Background	**Frequency**	**Percent**
Primary school	0	0,0
Secondary	25	23,4
College/University	82	76,6
Total	**107**	**100,0**
Province	**Frequency**	**Percent**
Eastern Cape	1	0,9
Free State	3	2,8

Gauteng	95	87,2
Limpopo	1	0,9
Mpumalanga	3	2,8
North-West	2	1,8
Western Cape	4	3,7
Total	**109**	**100,0**

Table 2: Participants Educational Location Distribution

Table 2 shows that 76,6% of the participants in the study were persons with college/university education background, meanwhile 23,4% were persons with secondary education. There was no person with primary education only in the study. Furthermore, 87,2% of the participants were residing in Gauteng, followed by Western ape (3,7%) and Free State (2,8%). The lowest represented province was Eastern Cape (0,9%).

4.3. Addressing the Research Objectives

4.3.1. Access to Digital Infrastructure

Figure 3: Consistent Access to Personal Digital Device

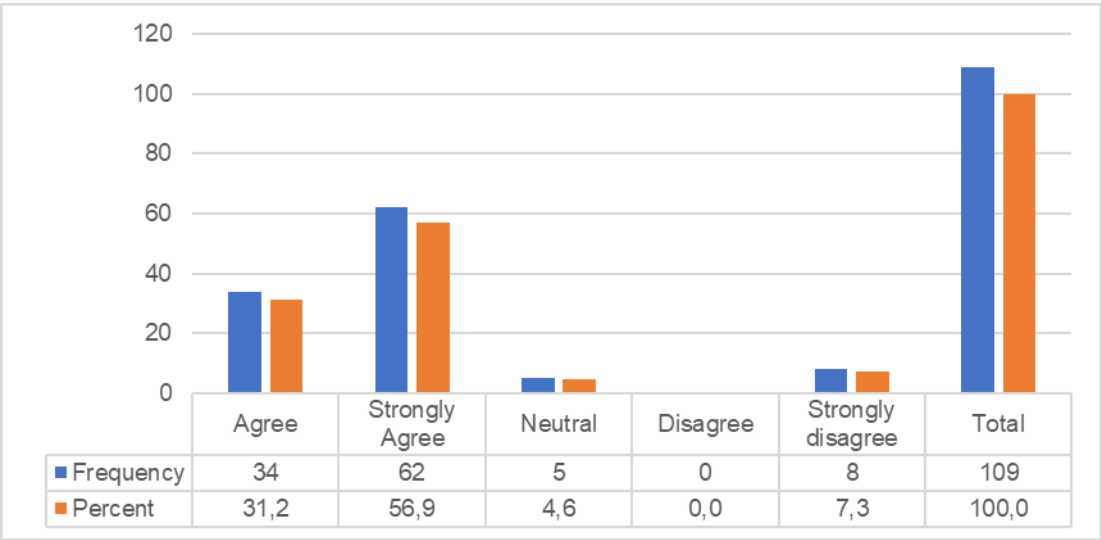
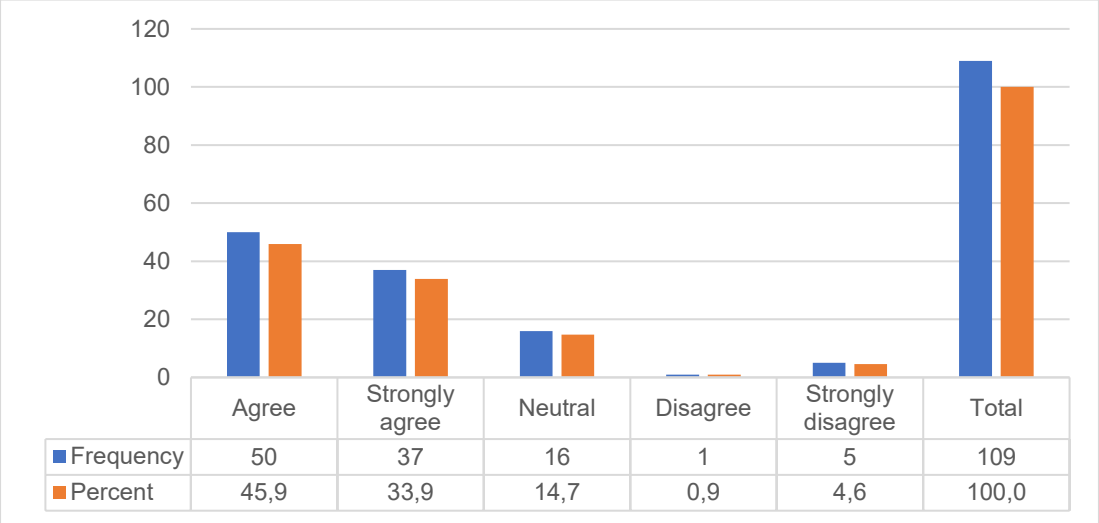


Figure 3 above shows the distribution of consistent access to a personal digital device such as computer, smartphone etc. Almost nine out of ten respondents indicated that they have consistent access to their personal digital device while one of out of ten indicated they do not have access to their personal digital device.

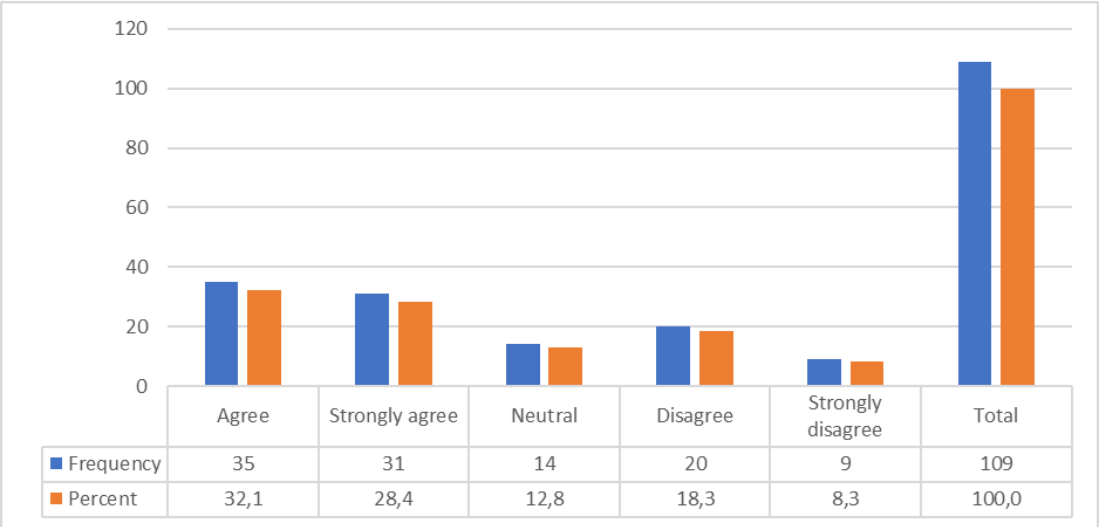
Figure 3: Reliable Access to High-Speed Internet



	Agree	Strongly agree	Neutral	Disagree	Strongly disagree	Total
Frequency	50	37	16	1	5	109
Percent	45,9	33,9	14,7	0,9	4,6	100,0

Figure 3 shows that Access to high-speed internet differs from individuals. Out the 109 participants in the study, more than seven in ten participants indicated that they have reliable access to high-speed internet while more than indicated that they are not sure meanwhile less than one in ten indicated that they do not have access to high-speed internet connection.

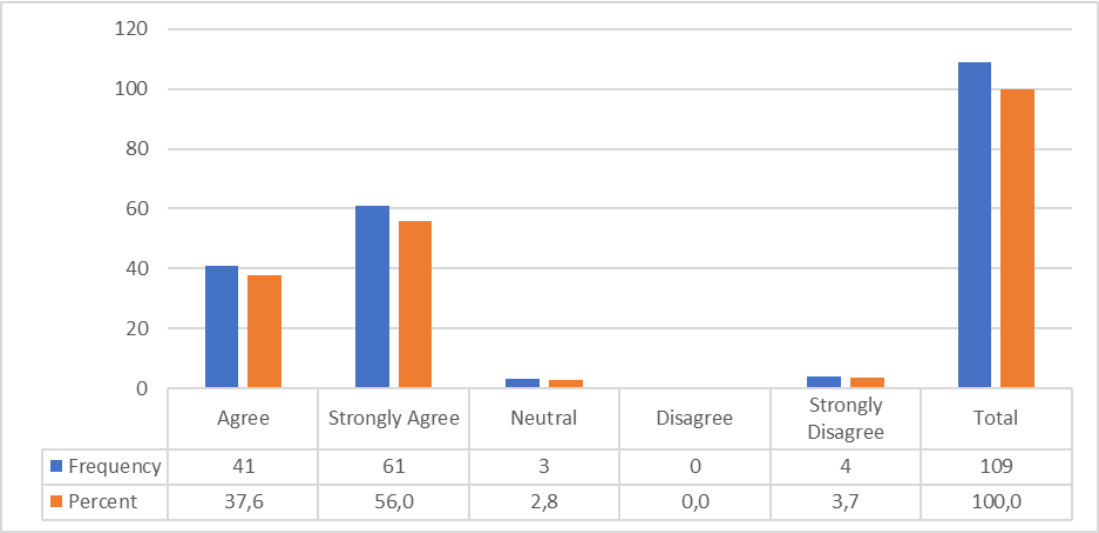
Figure 4: **Access to Digital Education resources**



	Agree	Strongly agree	Neutral	Disagree	Strongly disagree	Total
Frequency	35	31	14	20	9	109
Percent	32,1	28,4	12,8	18,3	8,3	100,0

Figure 4 shows the impact of the lack of access to digital technology affects people's education opportunities differently. About six in ten participants indicated that the lack of access to digital technology negatively affects their educational opportunities. Meanwhile, almost three in ten participants indicated that the lack of access to digital technology does not negatively affects their educational opportunities.

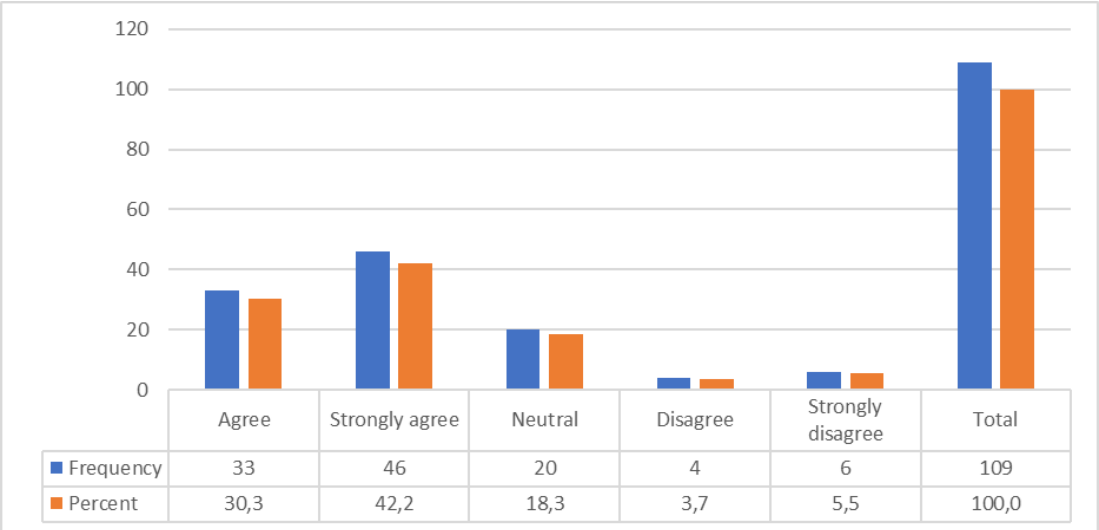
Figure 5: Digital Technology Access and Achieving Digital Equity



	Agree	Strongly Agree	Neutral	Disagree	Strongly Disagree	Total
Frequency	41	61	3	0	4	109
Percent	37,6	56,0	2,8	0,0	3,7	100,0

Figure 5 shows the distribution of believe that improving access to digital technology is essential for achieving digital equity. More than nine in ten participants indicated that they indeed believe that improving access to digital technology is essential for achieving digital equity compared to less than one in ten participants indicated that improving access to digital technology is not essential for achieving digital equity.

Figure 6: Impact of Limited Digital Access on Professional Growth

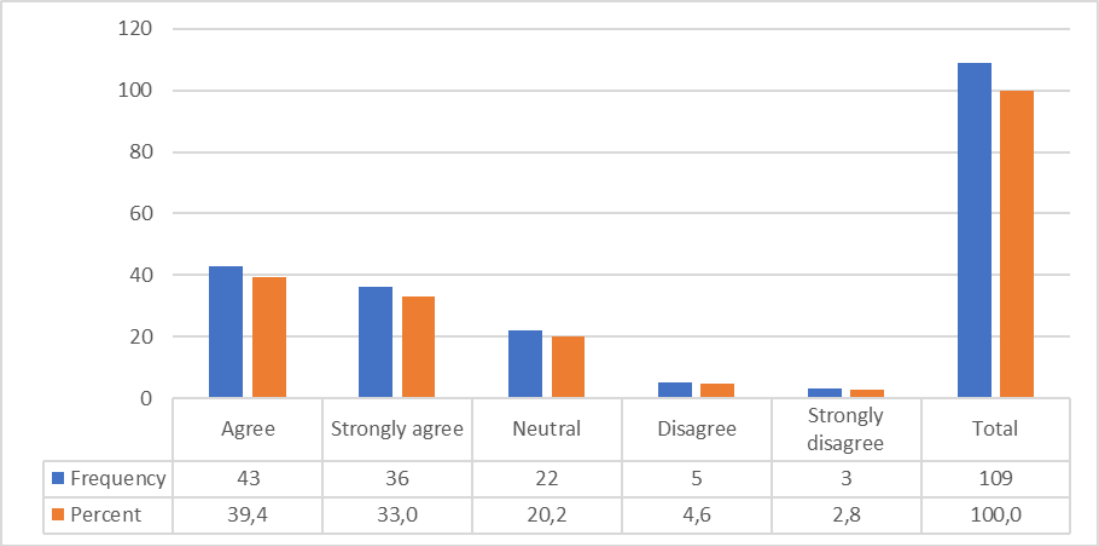


	Agree	Strongly agree	Neutral	Disagree	Strongly disagree	Total
Frequency	33	46	20	4	6	109
Percent	30,3	42,2	18,3	3,7	5,5	100,0

Figure 6: The impact of limited access to digital resources hinders professional growth and opportunities differently. It is evident that more than seven in ten participants highlighted that limited access to digital resources hinders their professional growth and opportunities.

Conversely, almost two in ten participants expressed uncertainty about the impact of limited access to digital resources on their professional growth and opportunities**.**

Figure 7: The absence of access to digital resources contributes to widening social and economic disparities.



	Agree	Strongly agree	Neutral	Disagree	Strongly disagree	Total
Frequency	43	36	22	5	3	109
Percent	39,4	33,0	20,2	4,6	2,8	100,0

Figure 7 shows that more than seven in ten participants indicated that the absence of access to digital resources contributes to the widening social and economic inequalities while two in ten indicated that they are not sure of the impact of the absence of access to digital resources towards the widening of social and economic disparities.

Figure 8: Distribution of believing that improving access to digital technology is essential for achieving digital equity

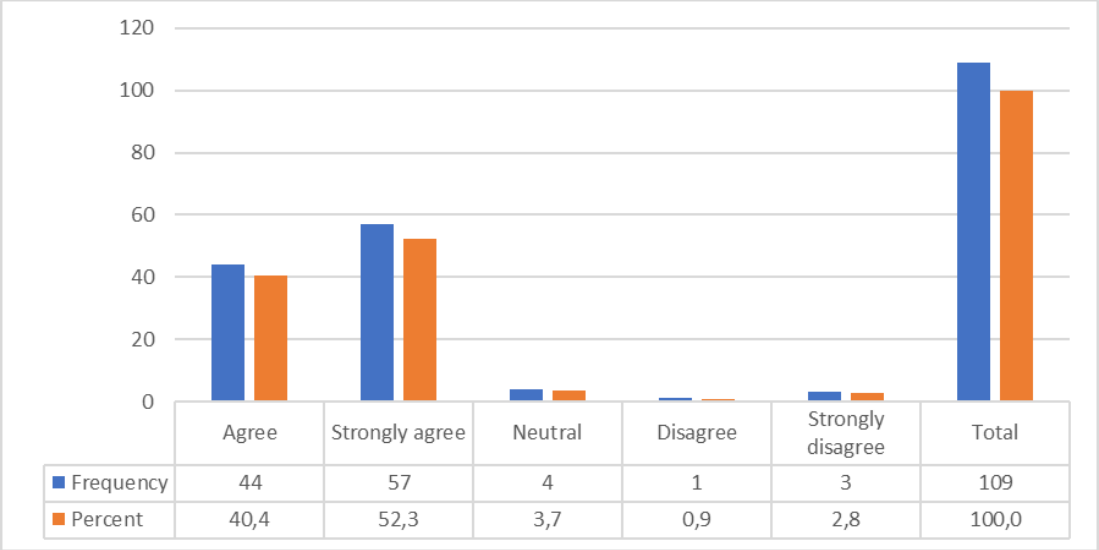


Figure 8 shows that more than nine in ten participants indicated that they believe that improving access to digital technology is essential towards achieving digital equity while less than one in ten participants indicated that they do not believing that improving access to digital technology is essential for achieving digital equity.

4.3.1.1. Cost of Accessing Digital

Figure 9: Distribution of the cost of technology is a significant barrier to accessing digital devices.

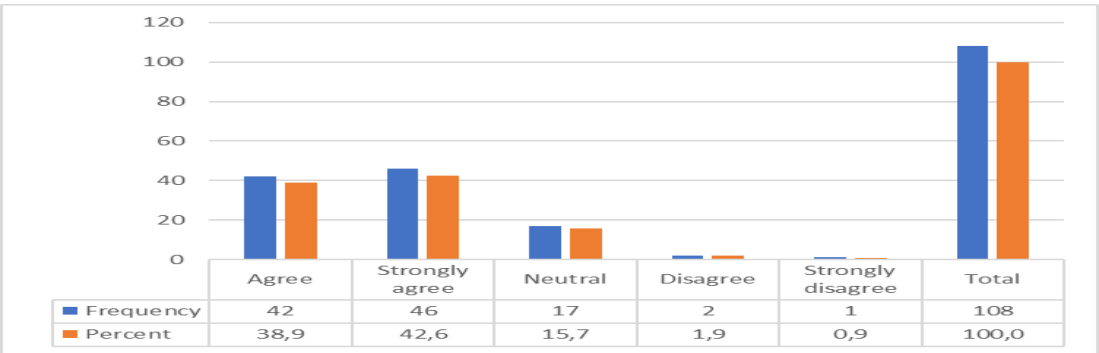
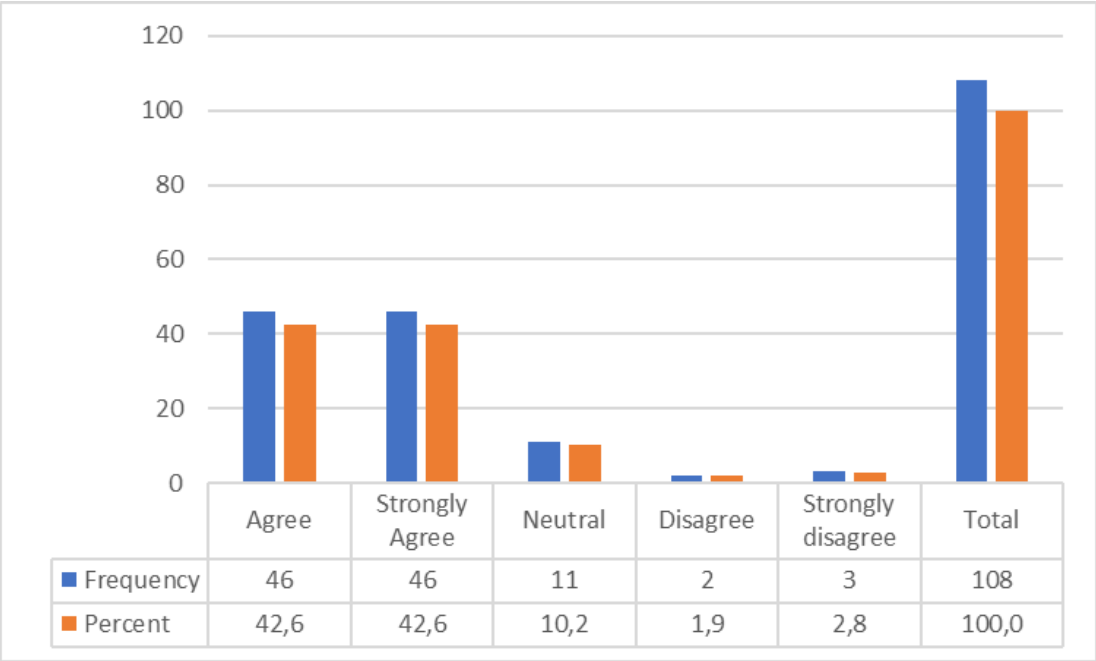


Figure 9 shows that majority of the participants agree that the cost of technology is a significant barrier to accessing digital devices where more than eight in ten participated that they agree versus less than two in ten participants indicating that they are not sure of the cost of technology playing any significant role in accessing digital devices.

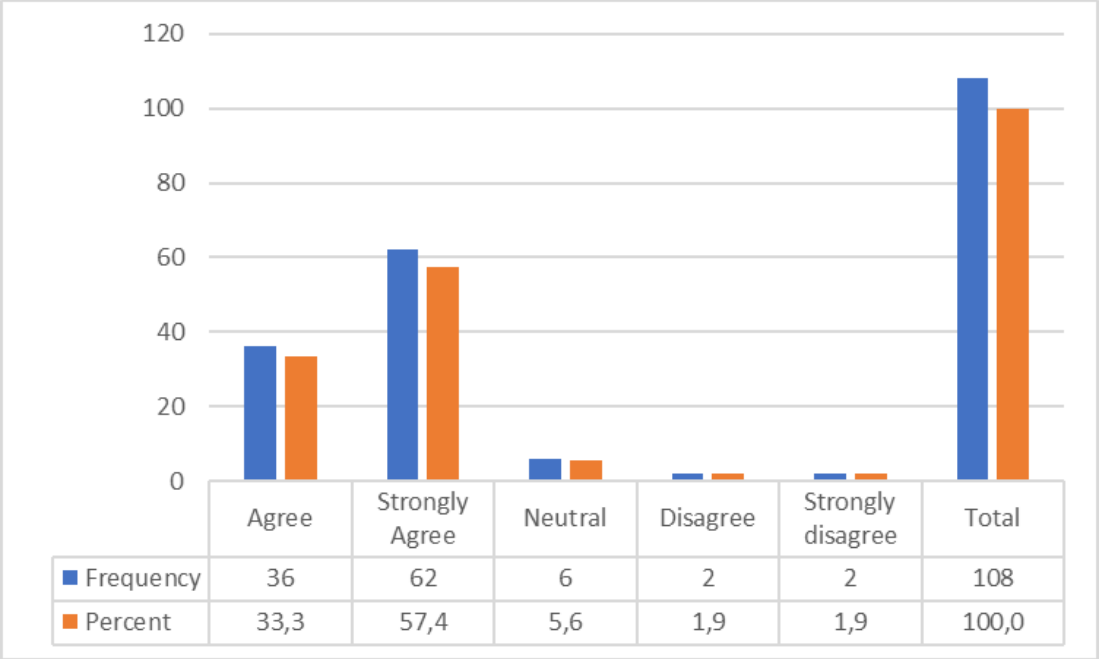
Figure 10:Distribution of high costs associated with internet connectivity hinder widespread access to digital resources.



	Agree	Strongly Agree	Neutral	Disagree	Strongly disagree	Total
Frequency	46	46	11	2	3	108
Percent	42,6	42,6	10,2	1,9	2,8	100,0

Figure 10 shows that more than eight in ten (80%) participants indicated that they agree that high costs associated with internet connectivity hinder widespread access to digital resources while one in ten participants indicated that they are not sure about the implication of the high costs associated with internet connectivity hinder widespread access to digital resources.

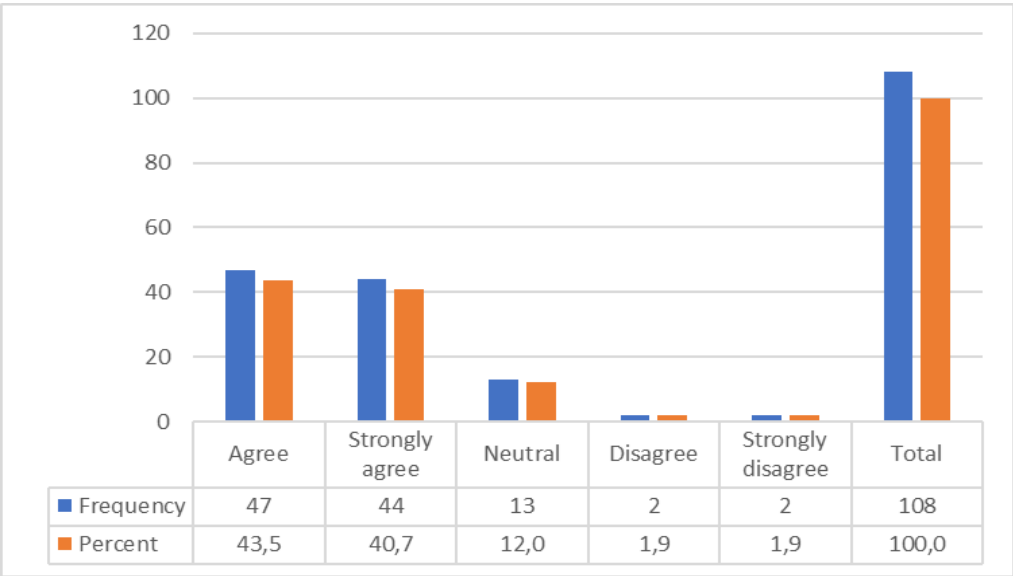
Figure 11: Distribution of individuals with limited financial means face challenges in affording necessary technology for digital participation



	Agree	Strongly Agree	Neutral	Disagree	Strongly disagree	Total
Frequency	36	62	6	2	2	108
Percent	33,3	57,4	5,6	1,9	1,9	100,0

Figure 11 shows that ninety percent (90,7%) of the participants indicated that they agree that individuals with limited financial means face challenges in affording necessary technology for digital participation while 9,3% indicated that not sure and do not agree that individuals with limited financial means face challenges in affording necessary technology for digital participation.

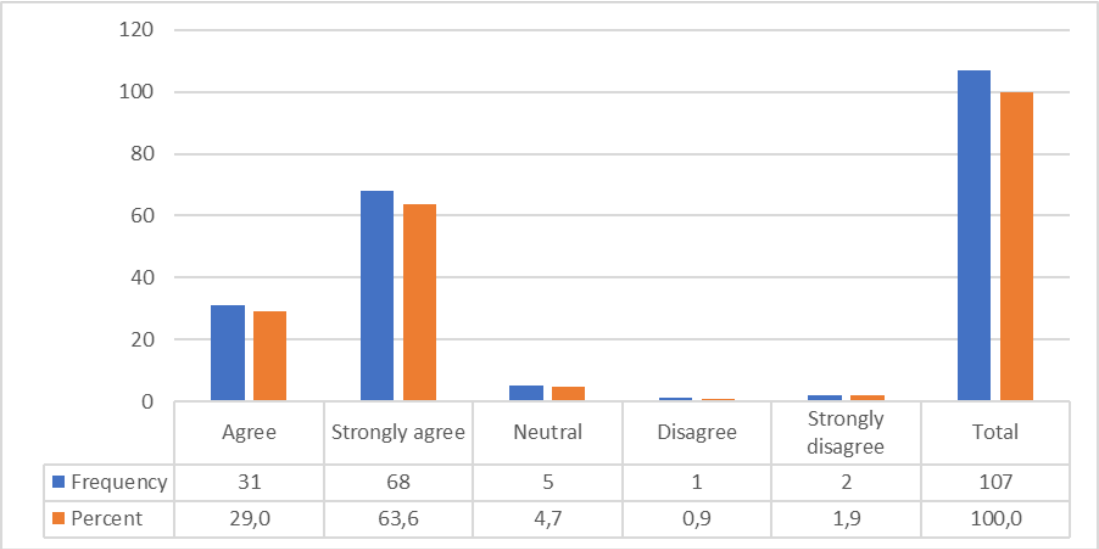
Figure 12: Distribution of the cost of technology is a significant barrier to accessing digital



	Agree	Strongly agree	Neutral	Disagree	Strongly disagree	Total
Frequency	47	44	13	2	2	108
Percent	43,5	40,7	12,0	1,9	1,9	100,0

Figure 12 indicates that most of the participants (84,2%) agree that investing in affordable technology options is essential for reducing the digital divide and promoting digital equity while 12% remains not sure while 3,8% do not agree that investing in affordable technology options is essential for reducing the digital divide and promoting digital equity.

Figure 13: Distribution of digital equity must be promoted across all areas by making sure everyone has access to affordable technology

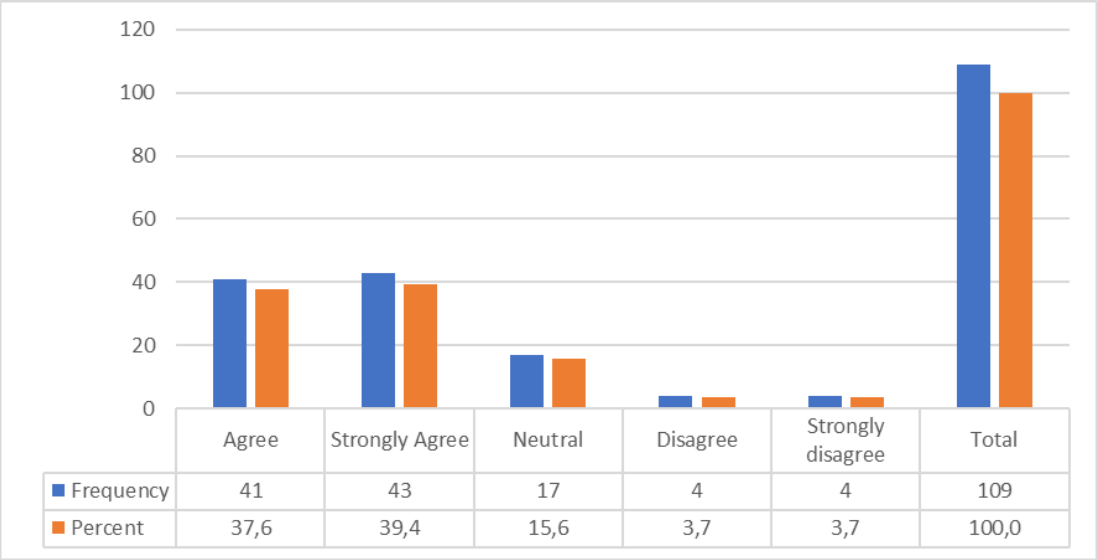


	Agree	Strongly agree	Neutral	Disagree	Strongly disagree	Total
Frequency	31	68	5	1	2	107
Percent	29,0	63,6	4,7	0,9	1,9	100,0

Figure 13 shows that ninety two percent (92,6%) indicated that they agree that digital equity must be promoted across all areas by making sure everyone has access to affordable technology, meanwhile, 7,4% indicated that they are not sure and do not agree that digital equity must be promoted across all areas by making sure everyone has access to affordable technology.

4.3.2. Digital Literacy

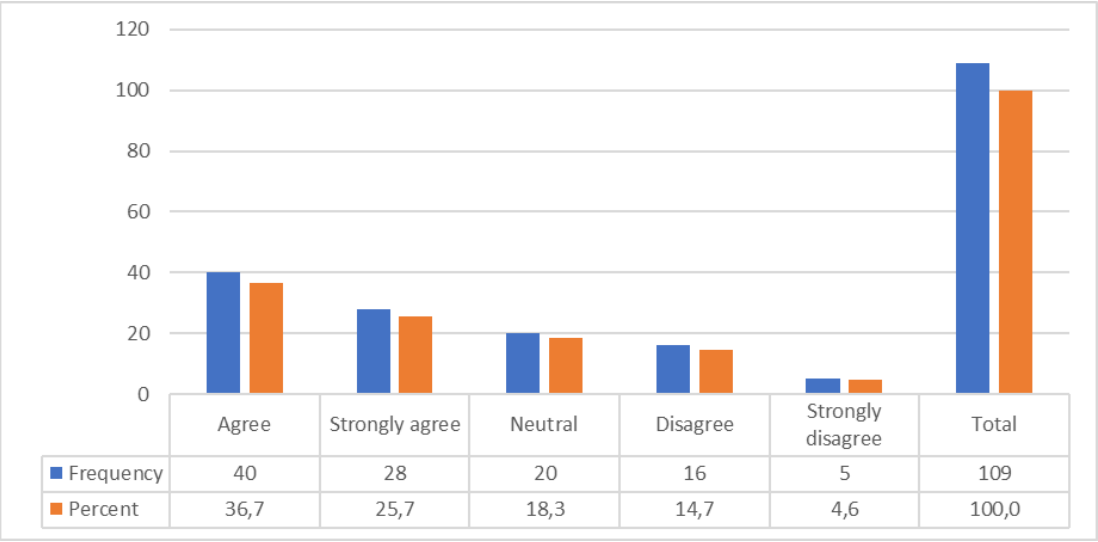
Figure 14: Distribution of better computer skills are greatly improved by education and reading.



	Agree	Strongly Agree	Neutral	Disagree	Strongly disagree	Total
Frequency	41	43	17	4	4	109
Percent	37,6	39,4	15,6	3,7	3,7	100,0

Figure 14 shows the distribution of better computer skills are greatly improved by education and reading. More than seven out of ten participants indicated that better computing skills are greatly improved by education and reading while almost two out of ten indicated that computer skills are not improved by education and reading.

Figure 15: Distribution of Higher-educated people are more likely to have access to technology and digital tools

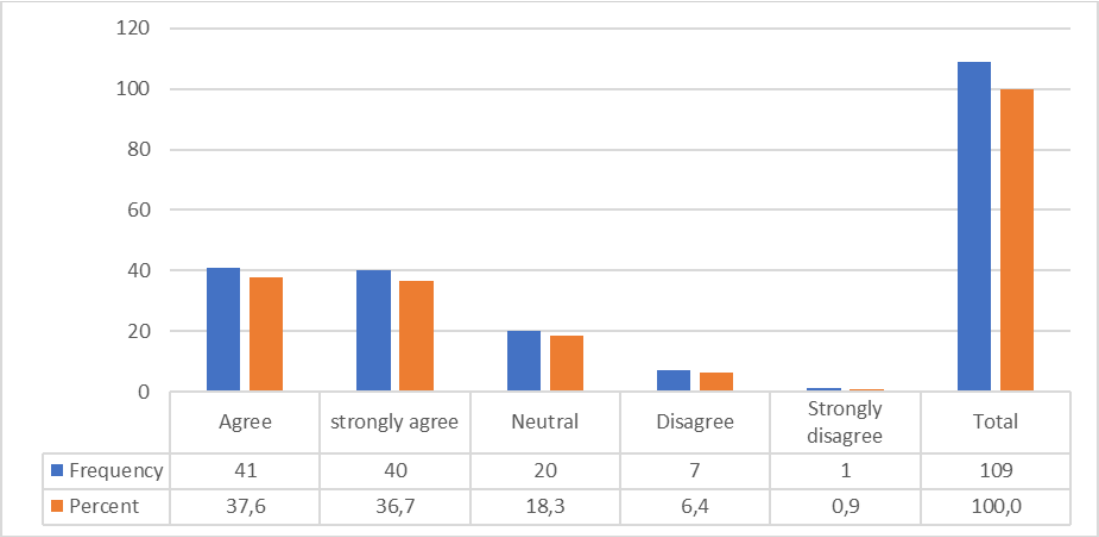


	Agree	Strongly agree	Neutral	Disagree	Strongly disagree	Total
Frequency	40	28	20	16	5	109
Percent	36,7	25,7	18,3	14,7	4,6	100,0

Figure 15 shows that close to seven out of ten participants indicated that they agree that higher educated people are more likely to have access to technology and digital tools. Furthermore,

almost two in ten participants indicated that they are not sure while less than two in ten participants indicated that they do not agree**.**

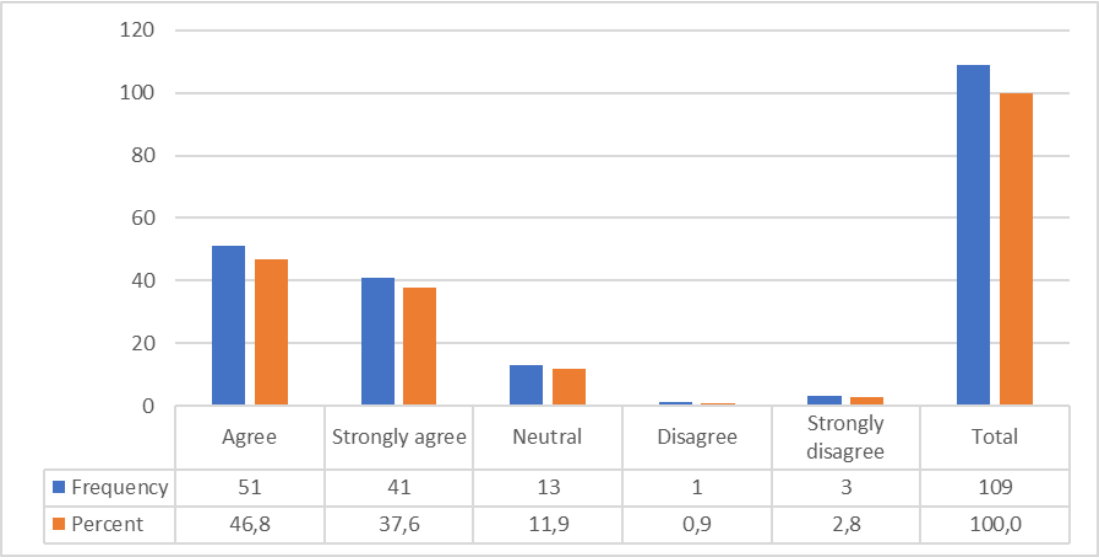
Figure 16:Distribution of uneven levels of schooling and literacy lead to digital divides, which make it harder for some people to get online



	Agree	strongly agree	Neutral	Disagree	Strongly disagree	Total
Frequency	41	40	20	7	1	109
Percent	37,6	36,7	18,3	6,4	0,9	100,0

Figure 16 shows the majority of the participants are in agreement that uneven levels of schooling and literacy lead to digital divides which makes it harder for some people to get online – 74,3% compared to 25,7%.

Figure 17:Distribution of it is possible to support digital equity across diverse communities by investing in educational programmes and projects



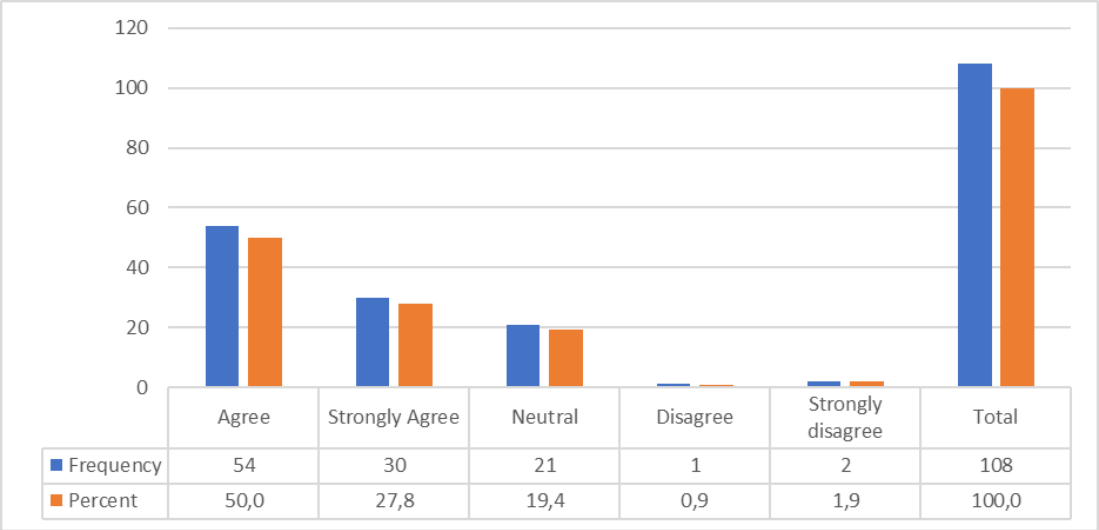
	Agree	Strongly agree	Neutral	Disagree	Strongly disagree	Total
Frequency	51	41	13	1	3	109
Percent	46,8	37,6	11,9	0,9	2,8	100,0

Figure 17 shows the distribution of it is possible to support digital equity across diverse communities by investing in educational programmes and projects. About 84.4% of the

participants indicated that they agree that it is possible to support digital equity across diverse communities by investing in educational programmes and projects while 11.9% indicated that they are not sure.

4.3.3. High quality content

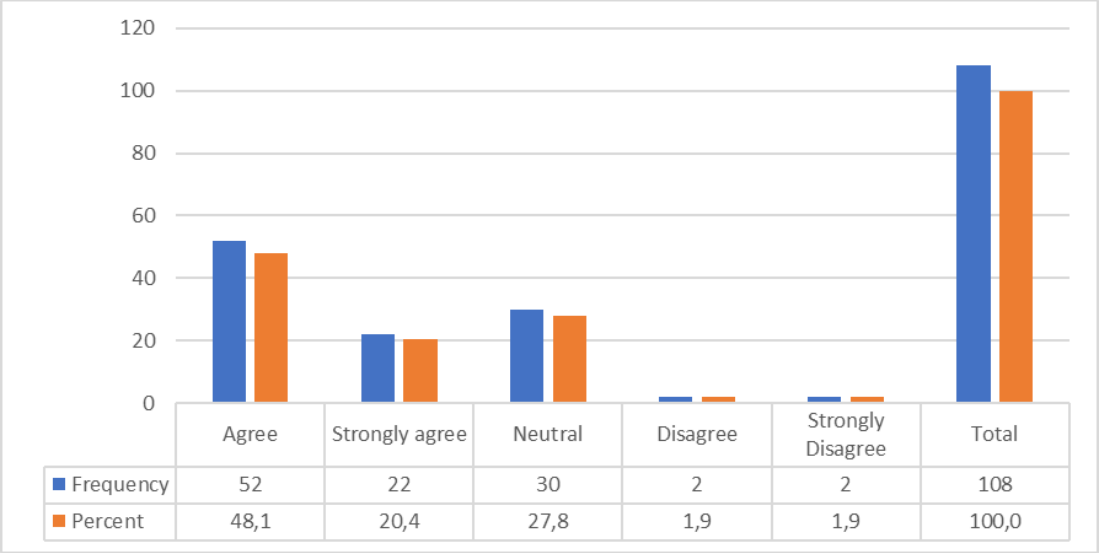
Figure 18:Distribution of the digital content is informative, providing valuable and relevant information.



	Agree	Strongly Agree	Neutral	Disagree	Strongly disagree	Total
Frequency	54	30	21	1	2	108
Percent	50,0	27,8	19,4	0,9	1,9	100,0

Figure 18 shows that 77,8% of the participants indicated that they agree that the digital content is informative, providing valuable and relevant information while 19,4% indicated that they are not sure that digital content is informative, providing valuable and relevant information. In addition, 2,8% indicated that they do not agree that digital content is informative, providing valuable and relevant information.

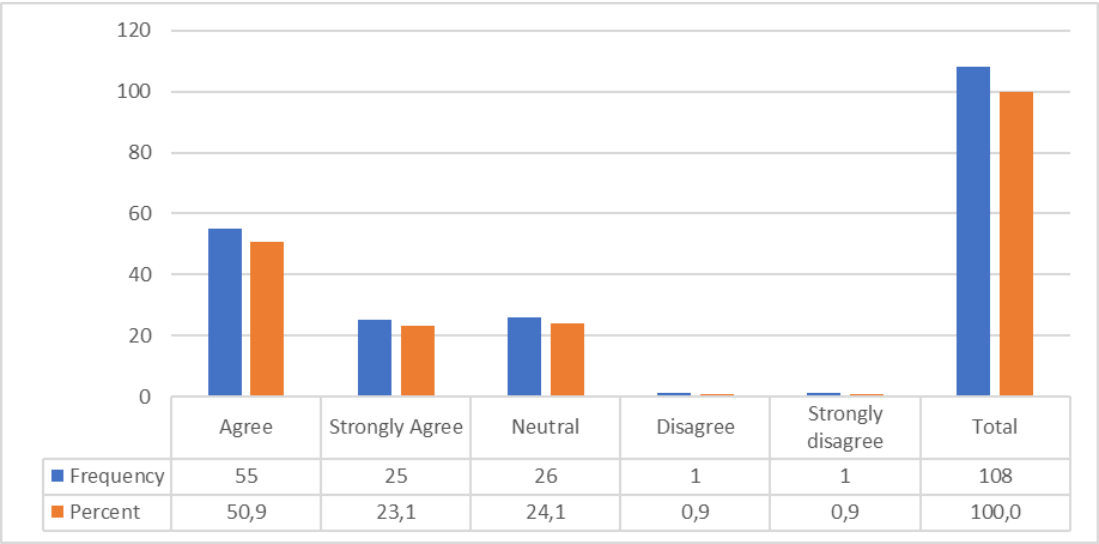
Figure 19:Distribution of the content is relevant to your needs and interests



	Agree	Strongly agree	Neutral	Disagree	Strongly Disagree	Total
Frequency	52	22	30	2	2	108
Percent	48,1	20,4	27,8	1,9	1,9	100,0

Figure 19 shows that close to 70% of the participants indicated that the content is relevant to their needs and interests meanwhile 27,8% remain unsure while 3,8% do not agree that the content is relevant to their needs and interests.

Figure 20: Distribution of the content is solution-oriented, offering practical solutions or insights



	Agree	Strongly Agree	Neutral	Disagree	Strongly disagree	Total
Frequency	55	25	26	1	1	108
Percent	50,9	23,1	24,1	0,9	0,9	100,0

Figure 20 shows that 74% of the participants indicated that they agree that the content is solution-oriented, offering practical solutions or insights while 24,1% of the participants indicated that they are not sure whether the content is solution-oriented, offering practical solutions or insights or not. In addition, 1,8% of the participants indicated they do not agree that the content is solution-oriented, offering practical solutions or insights

Figure 21:Distribution of Social inclusion is embraced by the material, which considers the different audience and points of view.

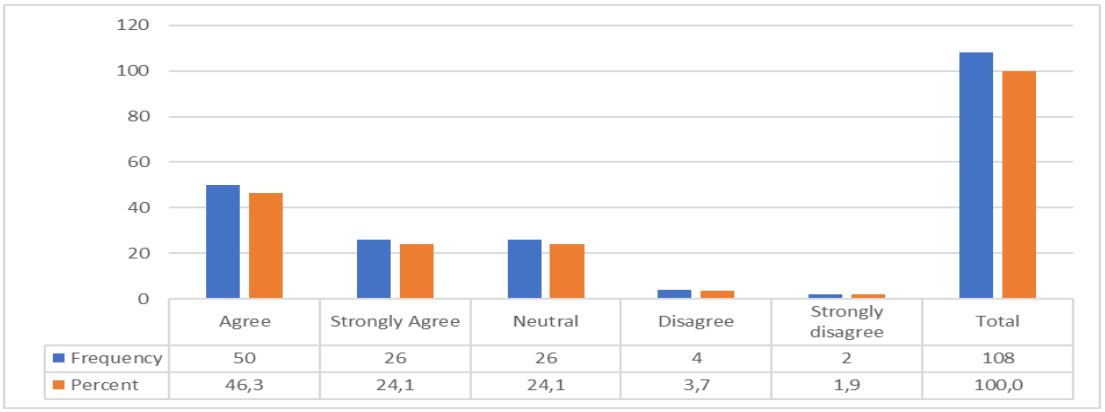


Figure 21 shows that 70,4% of the participants indicated that they agree that social inclusion is embraced by the material, which considers the different audience and points of view while 24,1% of the participants indicated that they are not sure that social inclusion is embraced by the material, which considers the different audience and points of view.

Figure 22: Distribution of the content is presented in a local language that enhances understanding

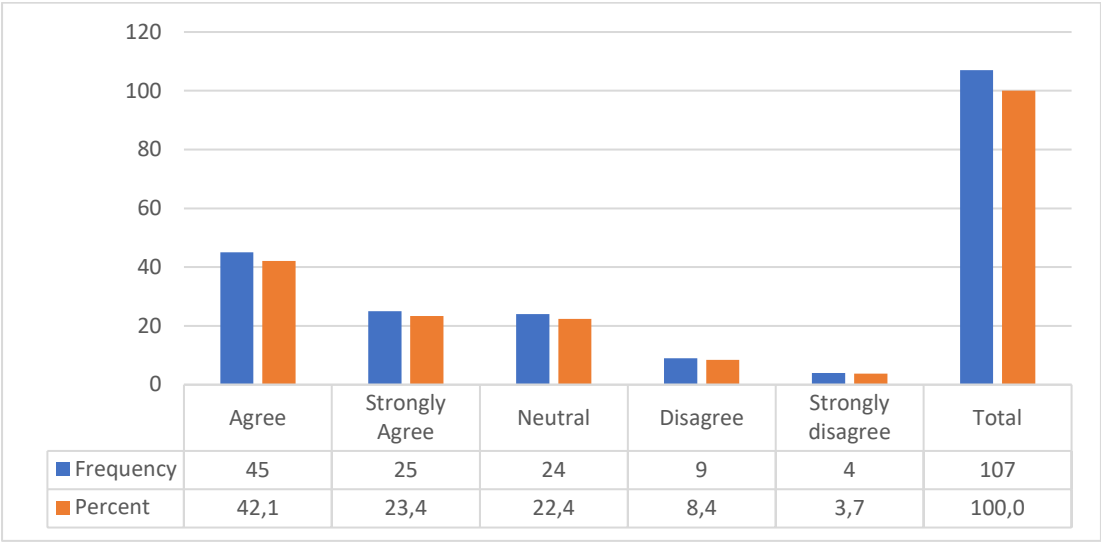
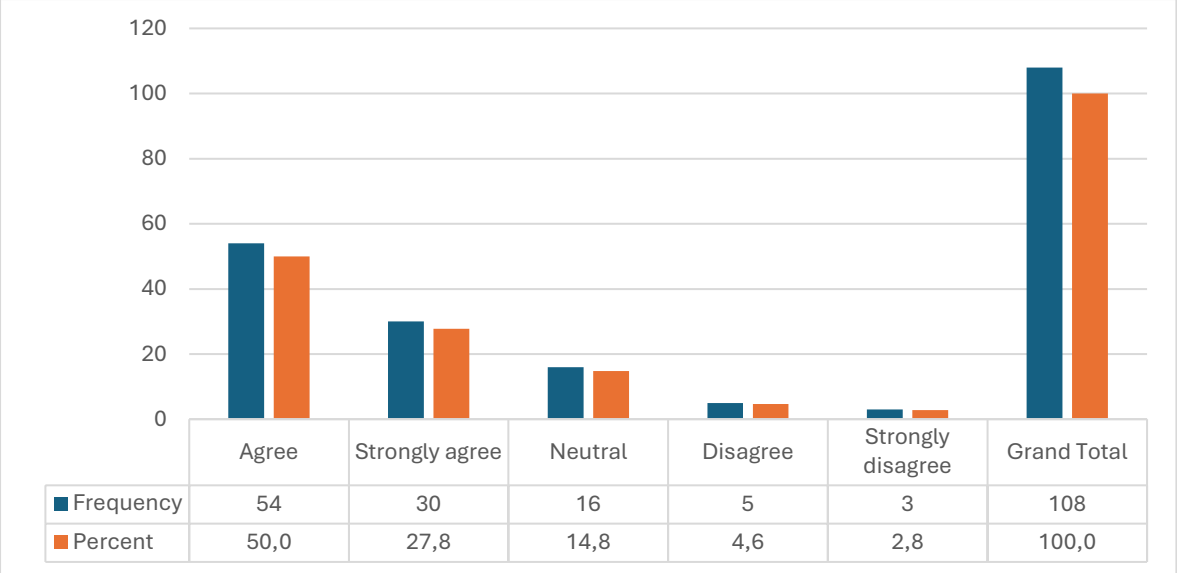


Figure 22 shows the use of local language on the enhancement of content understanding differs from one person to another. More than six out of ten participants indicated that they agree that the content that is presented in a local language enhances understanding while more than two in ten participants indicated that they are not sure if the use of the local language can enhance content understanding.

4.3.4. High Quality Content and Digital Equity

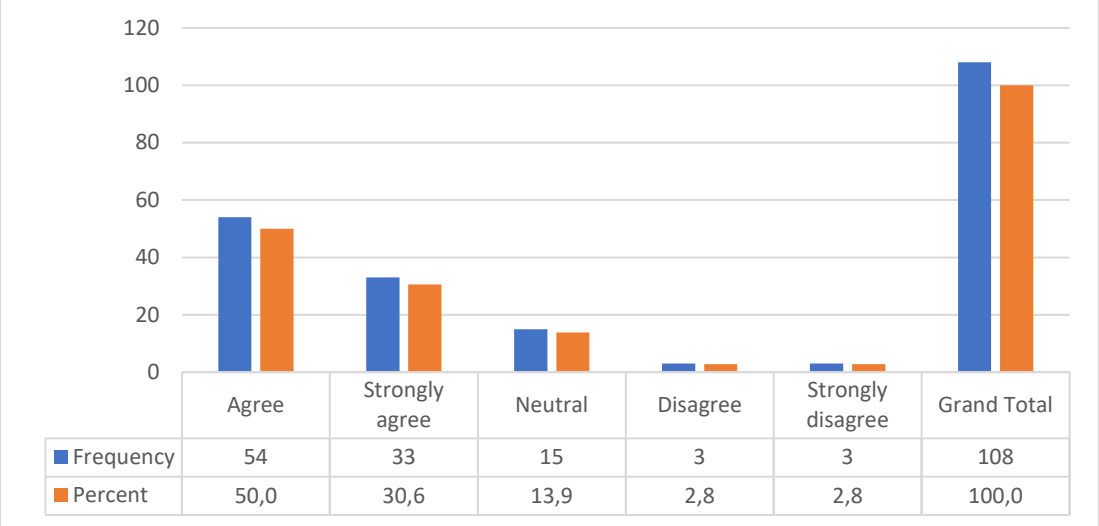
Figure 23: Distribution of having access to high-quality digital content is crucial for promoting digital equity



	Agree	Strongly agree	Neutral	Disagree	Strongly disagree	Grand Total
Frequency	54	30	16	5	3	108
Percent	50,0	27,8	14,8	4,6	2,8	100,0

Figure 23 shows that 77,8% of the participants agrees that having access to high-quality digital content is crucial for promoting digital while 14,8% remains unsure about having access to high-quality digital content is crucial for promoting digital. Meanwhile, 7,4% indicated that they do not agree that having access to high-quality digital content is crucial for promoting digital.

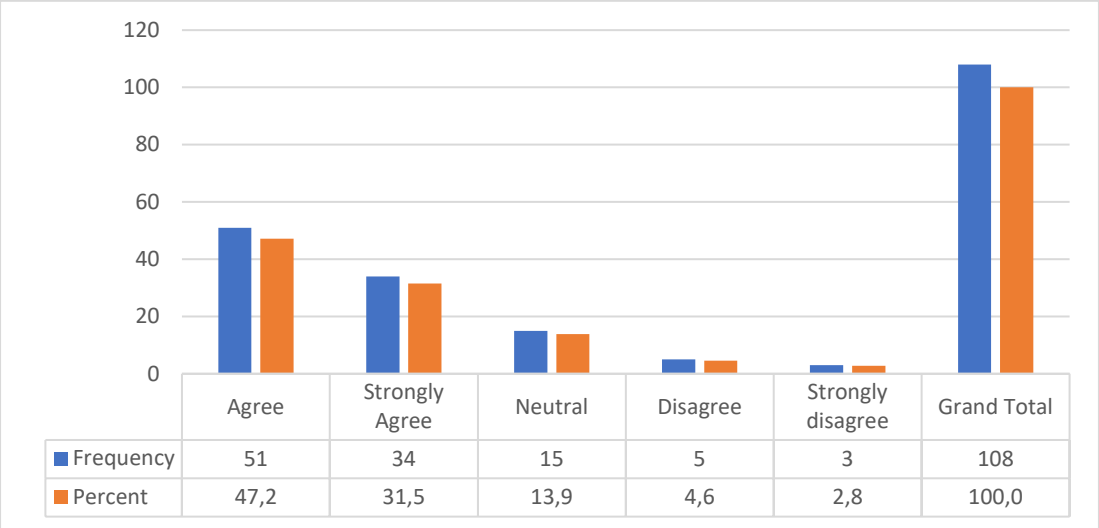
Figure 24: Distribution of high-quality digital content contributes to creating an inclusive online environment for people of diverse backgrounds



	Agree	Strongly agree	Neutral	Disagree	Strongly disagree	Grand Total
Frequency	54	33	15	3	3	108
Percent	50,0	30,6	13,9	2,8	2,8	100,0

Figure 24 shows that more than eight in ten participants in the study indicated that they agree that high-quality digital content contributes to creating an inclusive online environment for people from diverse backgrounds while less than two in ten participants indicated that they are not sure whether high-quality digital content does contribute to creating an inclusive online environment for people from diverse backgrounds**.**

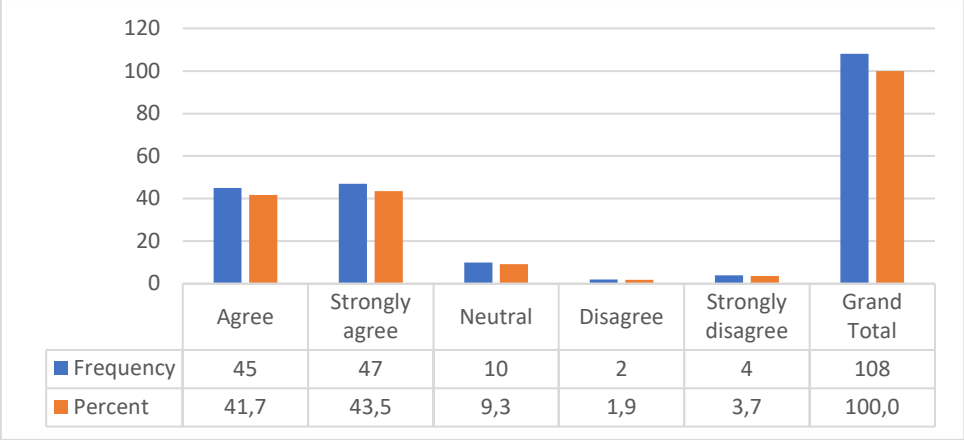
Figure 25: Distribution of individuals' digital skills and abilities improve when they access high-quality material online, which promotes digital equity



	Agree	Strongly Agree	Neutral	Disagree	Strongly disagree	Grand Total
Frequency	51	34	15	5	3	108
Percent	47,2	31,5	13,9	4,6	2,8	100,0

Figure 25 shows seventy-eight percent (78,7%) indicated that they are agree that Individuals' digital skills and abilities improve when they access high-quality material online, which promotes digital equity while 21,3% indicated that they are not sure and while some indicated that they do not agree that Individuals' digital skills and abilities does improve when they access high-quality material online, which promotes digital equity**.**

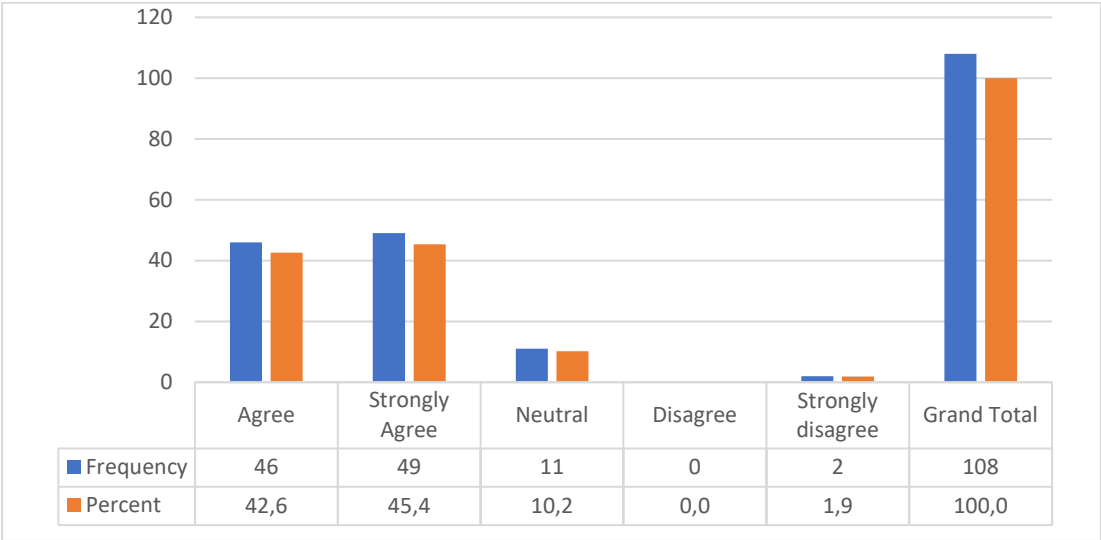
Figure 26: Distribution for everyone, regardless of their socio-economic background, access to high-quality digital material makes learning more possible.



	Agree	Strongly agree	Neutral	Disagree	Strongly disagree	Grand Total
Frequency	45	47	10	2	4	108
Percent	41,7	43,5	9,3	1,9	3,7	100,0

Figure 26 shows most of the participants agree that for everyone, regardless of their socioeconomic background, access to high-quality digital material makes learning more possible at 85,2% as compared to 9,3% who are not sure that for everyone, regardless of their socioeconomic background, access to high-quality digital material makes learning more possible. In addition, 5,6% of the participants do not agree that for everyone, regardless of their socioeconomic background, access to high-quality digital material makes learning more possible.

Figure 27: Distribution of promoting and investing in high-quality digital material can be a good way to help different communities get more out of their digital lives.



	Agree	Strongly Agree	Neutral	Disagree	Strongly disagree	Grand Total
Frequency	46	49	11	0	2	108
Percent	42,6	45,4	10,2	0,0	1,9	100,0

Figure 27 shows that 88% of the participants indicated that they agree that promoting and investing in high-quality digital material can be a good way to help different communities get more out of their digital lives while 10,2% remains unclear whether promoting and investing in high-quality digital material can be a good way to help different communities get more out of their digital lives or not**.**

4.4. Statistical Hypothesis Testing

The statistical analysis method known as Variance (VAR) is an essential instrument in quantitative research for comprehending the dispersion and Variability of data. The measure quantifies the extent to which data points deviate from the mean, offering a full summary of the distribution of the dataset.

Figure 28: Descriptions of VAR codes for hypothesis testing

Var1	I have consistent access to a personal digital device (e.g., computer, smartphone).
Var2	I have reliable access to high-speed internet.
Var3	The lack of access to digital technology negatively affects my educational opportunities.
Var4	I believe that improving access to digital technology is essential for achieving digital equity.
Var5	Limited access to digital resources hinders my professional growth and opportunities.
Var6	The absence of access to digital resources contributes to widening social and economic disparities.
Var7	I believe that improving access to digital technology is essential for achieving digital equity.
Var8	Better computer skills are greatly improved by education and reading.
Var9	Higher-educated people are more likely to have access to technology and digital tools.
Var10	Uneven levels of schooling and literacy lead to digital divides, which make it harder for some people to get online.
Var11	It is possible to support digital equity across diverse communities by investing in educational programmes and projects.
Var12	Education policies that are accessible and include everyone are very important for promoting digital equity across all kinds of groups.
Var13	The cost of technology is a significant barrier to accessing digital devices.
Var14	High costs associated with internet connectivity hinder widespread access to digital resources
Var15	Individuals with limited financial means face challenges in affording necessary technology for digital participation.
Var16	Investing in affordable technology options is essential for reducing the digital divide and promoting digital equity.
Var17	Digital equity must be promoted across all areas by making sure everyone has access to affordable technology.
Var21	The digital content is informative, providing valuable and relevant information
Var22	The content is relevant to your needs and interests
Var23	The content is solution-oriented, offering practical solutions or insights.
Var24	Social inclusion is embraced by the material, which takes into account the different audience and points of view.
Var25	The content is presented in a local language that enhances understanding
Var26	Having access to high-quality digital content is crucial for promoting digital equity
Var27	High-quality digital content contributes to creating an inclusive online environment for people from diverse backgrounds.
Var28	Individuals' digital skills and abilities improve when they access high-quality material online, which promotes digital equity.
Var29	For everyone, regardless of their socioeconomic background, access to high-quality digital material makes learning more possible.
Var30	Promoting and investing in high-quality digital material can be a good way to help different communities get more out of their digital lives.
	Consent Status

4.4.1. Hypothesis 1: Access to Digital Infrastructure

There is a significant positive relationship between overall access to digital technology (including consistent access to personal digital devices (VAR1), reliable access to high-speed internet(VAR2), and the absence of perceived limitations in digital resources(VAR 3) and the belief in the essential role of improving access for achieving digital equity(VAR4).

Table 3:VAR test access to technology and digital equity

Correlations

		VAR1	VAR2	VAR3	VAR4
VAR1	Pearson Correlation	1	.576**	.249**	.429**
	Sig. (2-tailed)		.000	.009	.000
	N	109	109	109	109
VAR2	Pearson Correlation	.576**	1	.193*	.384**
	Sig. (2-tailed)	.000		.045	.000
	N	109	109	109	109
VAR3	Pearson Correlation	.249**	.193*	1	.286**
	Sig. (2-tailed)	.009	.045		.003
	N	109	109	109	109
VAR4	Pearson Correlation	.429**	.384**	.286**	1
	Sig. (2-tailed)	.000	.000	.003	
	N	109	109	109	109

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

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

Table 3 shows that the p-values of the VAR4 against the other three Variables VAR1(0.000), VAR2(0.000) and VAR3(0.003) are less than the significance levels of 0.05, therefore there is There is a significant positive relationship between overall access to digital technology (including consistent access to personal digital devices, reliable access to high-speed internet, and the absence of perceived limitations in digital resources) and the belief in the essential role of improving access for achieving digital equity. Furthermore, their corresponding correlation coefficient between VAR4 and VAR1 (0.429), VAR2 (0.384) and VAR3(0.286) shows that significant positive relationship between overall access to digital technology (including consistent access to personal digital devices, reliable access to high-speed internet, and the absence of perceived limitations in digital resources) and the belief in the essential role of improving access for achieving digital equity**.**

4.4.1.1. Cost of technology

There is a statistically significant negative correlation between the cost of technology and digital equity.

Table 4: VAR test between cost of technology and digital equity

Correlations

		VAR00013	VAR00014	VAR00015	VAR00016	VAR00017	VAR00026	VAR00027	VAR00028	VAR00029	VAR00030
VAR00013	Pearson Correlation	1	.405**	.156	.209*	.220*	.086	.185	.180	.249**	.245*
	Sig. (2-tailed)		.000	.108	.030	.023	.376	.056	.062	.009	.011
	N	108	108	108	108	107	108	108	108	108	108
VAR00014	Pearson Correlation	.405**	1	.532**	.406**	.438**	.342**	.413**	.240*	.406**	.431**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.013	.000	.000
	N	108	108	108	108	107	108	108	108	108	108
VAR00015	Pearson Correlation	.156	.532**	1	.494**	.616**	.321**	.475**	.331**	.542**	.420**
	Sig. (2-tailed)	.108	.000		.000	.000	.001	.000	.000	.000	.000
	N	108	108	108	108	107	108	108	108	108	108
VAR00016	Pearson Correlation	.209*	.406**	.494**	1	.525**	.332**	.480**	.373**	.305**	.401**
	Sig. (2-tailed)	.030	.000	.000		.000	.000	.000	.000	.001	.000
	N	108	108	108	108	107	108	108	108	108	108
VAR00017	Pearson Correlation	.220*	.438**	.616**	.525**	1	.276**	.319**	.323**	.326**	.479**
	Sig. (2-tailed)	.023	.000	.000	.000		.004	.001	.001	.001	.000
	N	107	107	107	107	107	107	107	107	107	107
VAR00026	Pearson Correlation	.086	.342**	.321**	.332**	.276**	1	.553**	.438**	.246*	.342**
	Sig. (2-tailed)	.376	.000	.001	.000	.004		.000	.000	.010	.000
	N	108	108	108	108	107	108	108	108	108	108
VAR00027	Pearson Correlation	.185	.413**	.475**	.480**	.319**	.553**	1	.547**	.391**	.332**
	Sig. (2-tailed)	.056	.000	.000	.000	.001	.000		.000	.000	.000
	N	108	108	108	108	107	108	108	108	108	108
VAR00028	Pearson Correlation	.180	.240*	.331**	.373**	.323**	.438**	.547**	1	.409**	.470**
	Sig. (2-tailed)	.062	.013	.000	.000	.001	.000	.000		.000	.000
	N	108	108	108	108	107	108	108	108	108	108
VAR00029	Pearson Correlation	.249**	.406**	.542**	.305**	.328**	.246*	.391**	.409**	1	.460**
	Sig. (2-tailed)	.009	.000	.000	.001	.001	.010	.000	.000		.000
	N	108	108	108	108	107	108	108	108	108	108
VAR00030	Pearson Correlation	.245*	.431**	.420**	.401**	.479**	.342**	.332**	.470**	.460**	1
	Sig. (2-tailed)	.011	.000	.000	.000	.000	.000	.000	.000	.000	
	N	108	108	108	108	107	108	108	108	108	108

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

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

Table 4 shows the correlation coefficient of the Variables and their significance level. The significance levels are the p value that is used to determine the significance of a relationship between two variables, while the correlation coefficient reveals the strength of a relationship between two variables. When the p-value is less than 0.05, we reject the null hypothesis. (H2). There is a statistically significant negative correlation between the cost of technology and digital equity. The shows that there is a significant and positive correlation between cost of technology and digital equity because all their P-values are lower than 0.05 except for Variable association between VAR13 and VAR27 and VAR13 and VAR28. All their correlation coefficient is greater than zero, which suggests that there is a positive relationship**.**

4.4.2. Hypothesis 2: Digital literacy

Table 5:VAR Test between digital literacy and digital equity

Correlations

		VAR00026	VAR00027	VAR00028	VAR00029	VAR00030	VAR00008	VAR00009	VAR00010	VAR00011	VAR00012
VAR00026	Pearson Correlation	1	.553**	.438**	.246*	.342**	.289**	.140	.201*	.345**	.236*
	Sig. (2-tailed)		.000	.000	.010	.000	.002	.148	.037	.000	.014
	N	108	108	108	108	108	108	108	108	108	108
VAR00027	Pearson Correlation	.553**	1	.547**	.391**	.332**	.293**	.196*	.109	.403**	.257**
	Sig. (2-tailed)	.000		.000	.000	.000	.002	.042	.260	.000	.007
	N	108	108	108	108	108	108	108	108	108	108
VAR00028	Pearson Correlation	.438**	.547**	1	.409**	.470**	.367**	.401**	.070	.395**	.246*
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.473	.000	.010
	N	108	108	108	108	108	108	108	108	108	108
VAR00029	Pearson Correlation	.246*	.391**	.409**	1	.460**	.247*	.128	.136	.332**	.351**
	Sig. (2-tailed)	.010	.000	.000		.000	.010	.185	.159	.000	.000
	N	108	108	108	108	108	108	108	108	108	108
VAR00030	Pearson Correlation	.342**	.332**	.470**	.460**	1	.244*	.159	.231*	.378**	.383**
	Sig. (2-tailed)	.000	.000	.000	.000		.011	.100	.016	.000	.000
	N	108	108	108	108	108	108	108	108	108	108
VAR00008	Pearson Correlation	.289**	.293**	.367**	.247*	.244*	1	.404**	.230*	.223*	.216*
	Sig. (2-tailed)	.002	.002	.000	.010	.011		.000	.016	.020	.024
	N	108	108	108	108	108	109	109	109	109	109
VAR00009	Pearson Correlation	.140	.196*	.401**	.128	.159	.404**	1	.119	.215*	.210*
	Sig. (2-tailed)	.148	.042	.000	.185	.100	.000		.218	.025	.028
	N	108	108	108	108	108	109	109	109	109	109
VAR00010	Pearson Correlation	.201*	.109	.070	.136	.231*	.230*	.119	1	.248**	.354**
	Sig. (2-tailed)	.037	.260	.473	.159	.016	.016	.218		.009	.000
	N	108	108	108	108	108	109	109	109	109	109
VAR00011	Pearson Correlation	.345**	.403**	.395**	.332**	.378**	.223*	.215*	.248**	1	.377**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.020	.025	.009		.000
	N	108	108	108	108	108	109	109	109	109	109
VAR00012	Pearson Correlation	.236*	.257**	.246*	.351**	.383**	.216*	.210*	.354**	.377**	1
	Sig. (2-tailed)	.014	.007	.010	.000	.000	.024	.028	.000	.000	
	N	108	108	108	108	108	109	109	109	109	109

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

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

Table 5 above shows the correlation coefficient of the variables and their significance level. The significance levels are the p value that is used to determine the significance of a relationship between two Variables, while the correlation coefficient reveals the strength of a relationship between two Variables. When the p-value is less than 0.05, we reject the null hypothesis. There is significant relationship between digital literacy and digital equity. The relationship between digital literacy and digital equity remains unclear simply because there are too many Variables that have a positive relationship, yet they are not statistically significant. For example, VAR9 and VAR26, VAR29 and VAR10, VAR29 and VAR9. However, there are some variables that have a positive and statistical significance relationships such as VAR12 and VAR26 also VAR12 and VAR25.

4.4.3. Hypothesis 3: High Quality Content

Table 6:VAR Test between high quality content and digital equity

Correlations

		VAR00026	VAR00027	VAR00028	VAR00029	VAR00030	VAR00021	VAR00022	VAR00023	VAR00024	VAR00025
VAR00026	Pearson Correlation	1	.553**	.438**	.246*	.342**	.330**	.444**	.247*	.433**	.452**
	Sig. (2-tailed)		.000	.000	.010	.000	.000	.000	.010	.000	.000
	N	108	108	108	108	108	108	108	108	108	107
VAR00027	Pearson Correlation	.553**	1	.547**	.391**	.332**	.315**	.414**	.133	.423**	.353**
	Sig. (2-tailed)	.000		.000	.000	.000	.001	.000	.171	.000	.000
	N	108	108	108	108	108	108	108	108	108	107
VAR00028	Pearson Correlation	.438**	.547**	1	.409**	.470**	.270**	.397**	.285**	.369**	.357**
	Sig. (2-tailed)	.000	.000		.000	.000	.005	.000	.003	.000	.000
	N	108	108	108	108	108	108	108	108	108	107
VAR00029	Pearson Correlation	.246*	.391**	.409**	1	.460**	.242*	.355**	.215*	.423**	.264**
	Sig. (2-tailed)	.010	.000	.000		.000	.012	.000	.026	.000	.006
	N	108	108	108	108	108	108	108	108	108	107
VAR00030	Pearson Correlation	.342**	.332**	.470**	.460**	1	.578**	.541**	.344**	.284**	.386**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.000	.003	.000
	N	108	108	108	108	108	108	108	108	108	107
VAR00021	Pearson Correlation	.330**	.315**	.270**	.242*	.578**	1	.489**	.283**	.298**	.435**
	Sig. (2-tailed)	.000	.001	.005	.012	.000		.000	.003	.002	.000
	N	108	108	108	108	108	108	108	108	108	107
VAR00022	Pearson Correlation	.444**	.414**	.397**	.355**	.541**	.489**	1	.291**	.564**	.371**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.002	.000	.000
	N	108	108	108	108	108	108	108	108	108	107
VAR00023	Pearson Correlation	.247*	.133	.285**	.215*	.344**	.283**	.291**	1	.333**	.399**
	Sig. (2-tailed)	.010	.171	.003	.026	.000	.003	.002		.000	.000
	N	108	108	108	108	108	108	108	108	108	107
VAR00024	Pearson Correlation	.433**	.423**	.369**	.423**	.284**	.298**	.564**	.333**	1	.395**
	Sig. (2-tailed)	.000	.000	.000	.000	.003	.002	.000	.000		.000
	N	108	108	108	108	108	108	108	108	108	107
VAR00025	Pearson Correlation	.452**	.353**	.357**	.264**	.386**	.435**	.371**	.399**	.395**	1
	Sig. (2-tailed)	.000	.000	.000	.006	.000	.000	.000	.000	.000	
	N	107	107	107	107	107	107	107	107	107	107

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

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

Table 6: shows the correlation coefficient of the variables and their significance level. The significance levels is the p value that is used to determine the significance of a relationship between two Variables, while, the correlation coefficient reveals the strength of a relationship between two Variables. When the p-value is less than 0.05, we reject the null hypothesis. High quality content, there is significant relationship and between high quality content and digital equity. The table above shows that there is a statistical significance relationship between high quality content and digital equity. This is because the p-values of all Variables except VAR23 and VAR27 are less than 0.05. Furthermore, the correlation coefficient is all more than zero, which means that there is a positive relationship between high quality content and digital equity.

Table 7:VAR test between high-quality content and the promotion of digital equity

Correlations

		VAR00030	VAR00021	VAR00022	VAR00023	VAR00024	VAR00025
VAR30	Pearson Correlation	1	.578**	.541**	.344**	.284**	.386**
	Sig. (2-tailed)		.000	.000	.000	.003	.000
	N	108	108	108	108	108	107
VAR21	Pearson Correlation	.578**	1	.489**	.283**	.298**	.435**
	Sig. (2-tailed)	.000		.000	.003	.002	.000
	N	108	108	108	108	108	107
VAR22	Pearson Correlation	.541**	.489**	1	.291**	.564**	.371**
	Sig. (2-tailed)	.000	.000		.002	.000	.000
	N	108	108	108	108	108	107
VAR23	Pearson Correlation	.344**	.283**	.291**	1	.333**	.399**
	Sig. (2-tailed)	.000	.003	.002		.000	.000
	N	108	108	108	108	108	107
VAR24	Pearson Correlation	.284**	.298**	.564**	.333**	1	.395**
	Sig. (2-tailed)	.003	.002	.000	.000		.000
	N	108	108	108	108	108	107
VAR25	Pearson Correlation	.386**	.435**	.371**	.399**	.395**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	107	107	107	107	107	107

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

Table 7: shows the correlation coefficient of the variables and their significance level. The significance levels are the p value that is used to determine the significance of a relationship between two Variables, while the correlation coefficient reveals the strength of a relationship between two Variables. When the p-value is less than 0.05, we reject the null hypothesis.

There exists a statistically significant positive relationship between access to high-quality digital content and the promotion of digital equity (VAR30). The correlation coefficients show of promotion of digital equity (VAR30) against all other variables of high-quality digital content are above 0. i.e. VAR21(0.578), VAR22(0.541), VAR23(0.344), VAR24(0.284) and VAR (0.386) with their corresponding p-values of less than 0.005 shows that we reject the null hypothesis and conclude that There exists a statistically significant positive relationship between access to high-quality digital content and the promotion of digital equity (VAR30

5. CHAPTER 5. SUMMARY OF FINDINGS AND RECOMMENDATIO

5.1. Summary

Digital apartheid remains a critical issue in South Africa, manifesting stark inequalitiein digital access that mirror broader socio-economic inequalities. This study aims to investigate the complexities of digital redlining in South Africa, identifying contributing factors and evaluating the potential of digital equity as a solution. The research focuses on several key hypotheses concerning access, cost, digital literacy, high-quality content, and social inclusion to illuminate the dynamics of digital equality within the country.

The primary objective of the study is to uncover the factors underlying digital redlining in South Africa. This involves a meticulous examination of infrastructure disparities, economic barriers, and regional policies that systematically marginalize certain communities from accessing digital resources. By understanding these factors comprehensively, the study aims to provide insights into how digital redlining perpetuates socio-economic inequality across the nation.

The second objective centres on investigating the barriers that hinder digital equity in South Africa. These barriers include financial constraints that limit access to digital devices and internet services, inadequate digital literacy among various demographic groups, and the absence of relevant and accessible digital content tailored to local needs. Addressing these challenges is pivotal for developing effective strategies that promote digital inclusivity and bridge the digital divide across different socio-economic strata.

Lastly, the study aims to propose actionable recommendations aimed at ensuring digital equity and addressing digital redlining in South Africa. Drawing on synthesized insights from the research findings, these recommendations are tailored for policymakers, educators, and community leaders. They are designed to facilitate equal access to digital opportunities for all South Africans, thereby fostering a more inclusive digital landscape.

The study concludes that digital redlining in South Africa represents a significant obstacle to achieving socio-economic equity through digital means. By highlighting the interplay of access, affordability, literacy, content relevance, and social inclusion, the research highlights

the urgency of targeted interventions. These interventions, informed by empirical evidence, are essential for policymakers and stakeholders seeking to mitigate the impacts of digital apartheid and promote a more equitable digital future in South Africa.

In essence, this study contributes to the academic discourse on digital inequality by providing a nuanced understanding of digital redlining in the South African context. It highlights the importance of comprehensive strategies that not only enhance access to digital resources but also address the underlying socio-economic barriers that perpetuate digital exclusion. By implementing the study's recommendations, South Africa can take significant strides towards bridging the digital divide and promoting broader socio-economic development in the digital age.

5.2. Findings

The findings of this study substantiate hypothesis (H1), which posits a significant connection between digital equity and digital redlining in South Africa. Digital redlining, characterized by unequal access to digital resources based on socio-economic factors, remains a critical issue exacerbating existing inequalities across the country.

This research question investigates various factors contributing to digital redlining in South Africa. The study identifies inequalitiein broadband infrastructure as a significant barrier, particularly the uneven distribution of high-speed internet access between urban and rural areas. Economic constraints also play a crucial role, with the high cost of digital devices and internet services limiting access for low-income households. Additionally, inadequate regional policies fail to effectively address these disparities, exacerbating digital exclusion among marginalized communities. These findings underscore the hypothesis by establishing a comprehensive understanding of how infrastructure gaps, economic limitations, and policy shortcomings perpetuate digital inequality and reinforce socio-economic inequalities across the country

The findings highlight a clear positive correlation between enhanced digital equity and reduced examples of digital exclusion. Improved access to personal digital devices and affordable internet services emerges as crucial factors in lowering barriers to digital resources. Strategic

investments in broadband infrastructure development, particularly in underserved regions, are identified as pivotal in bridging the digital divide. This correlation directly supports hypothesis (H1) by demonstrating that efforts aimed at bolstering digital equity can effectively counteract the systemic exclusion identified in Research Question 1. By enhancing accessibility and affordability, digital equity initiatives contribute significantly to reducing inequality and promoting more equitable access to digital opportunities across diverse demographic groups in South Africa.

The recommendations to promote digital equity and address digital redlining comprehensively. These recommendations include expanding broadband infrastructure to underserved areas, establishing accessible public digital hubs such as community centers and libraries, and reducing the cost of digital technologies through subsidies and affordable pricing plans. Enhancing digital literacy through widespread educational programmes and integrating digital skills into the national curriculum are crucial steps to empower individuals with the necessary competencies to navigate and utilize digital resources effectively. Moreover, fostering the creation and dissemination of culturally relevant digital content ensures that digital platforms cater to diverse community needs and interests, thereby enhancing inclusivity. Promoting social inclusion through community engagement initiatives and support networks further empowers marginalized groups in leveraging digital tools for personal and professional development. These strategies collectively reinforce the hypothesis by outlining practical measures to bridge the digital divide and advance digital inclusion across South Africa.

5.3. Recommendations

Recommendation 1. Affordability Initiatives

Lowering the costs associated with digital technologies is paramount to enhancing digital equity. Collaboration with internet service providers to develop affordable pricing plans tailored for low-income families is recommended. Additionally, implementing subsidies and financial assistance programmes for digital devices can significantly increase ownership and usage rates among marginalized communities. Tax incentives for manufacturers and retailers can further contribute to reducing the overall cost burden on consumers.

Recommendation 2. Education and Training

Enhancing digital literacy across diverse demographic groups is critical for empowering individuals to effectively use digital tools and navigate digital spaces. Comprehensive training programmes should be developed and implemented, targeting different age groups, educational levels, and professional backgrounds. Integrating digital literacy into the national education curriculum from primary to tertiary levels ensures continuous exposure and skill development. Community workshops and training sessions should also be organized to reach individuals outside formal education systems, promoting broader digital literacy and competence.

Recommendation 3. Content Development

Investing in the creation and dissemination of high-quality, locally relevant digital content is essential for fostering a more inclusive online environment. This content should address the specific needs and interests of diverse South African communities, enhancing engagement and relevance. Establishing platforms that curate and recommend educational and informational content will ensure that users have access to valuable resources that support their personal and professional growth. Partnerships with educational institutions, media houses, and independent content creators are crucial to enriching the digital content landscape and ensuring its accessibility.

Recommendation 4. Inclusive Policies

Developing and implementing policies that promote digital inclusion and equity is fundamental to addressing digital redlining. These policies should be designed in collaboration with marginalized communities to ensure they meet local needs and contexts effectively. Establishing support networks and mentorship programmes can further empower individuals from these communities to leverage digital tools for personal and professional development. Inclusive policy-making processes should prioritize input from diverse stakeholders, including community leaders, educators, and policymakers, to foster sustainable digital equity initiatives.

5.4. Contribution to New Knowledge

The study makes major contributions to our understanding of digital redlining and equity in South Africa. The findings offer policymakers, educators, and **Contribution** stakeholders' useful insights for implementing targeted interventions to improve digital fairness. The comprehensive examination of components and their interactions enriches the existing research on digital inclusion and redlining.

This study contributes to our understanding of the complexity of digital equity in South Africa. The report offers a road map for creating a more equitable digital landscape by emphasising the multiple linkages between access, cost, literacy, content quality, and social inclusion. The observed limitations highlight the necessity for ongoing research in this rapidly expanding field to ensure that interventions are based on strong and current evidence.

6. CHAPTER 6. CONCLUSION

6.1. Introduction

This study represents the culmination of a thorough investigation into the elements impacting digital equity and redlining in South Africa. This study used rigorous research and analysis to uncover the intricacies of access, affordability, digital literacy, high-quality content, and social inclusion, providing significant insights on the country's digital inclusion landscape. As we conclude our journey, it is critical to reflect on the important takeaways, draw implications from the findings, admit limits, and provide meaningful recommendations for future research and practical application.

6.2. Summary

The study found a positive relationship between access to digital technologies and digital equity, with a significant negative link to the cost of digital technologies. Digital literacy was found to be a complex determinant of digital equity, but not necessarily guaranteed. High-quality content was found to be crucial for fostering a more inclusive online environment. Social inclusion was found to be positively correlated with access to high-quality digital information.

6.3. Findings

In summarising the findings, it is clear that achieving digital equity in South Africa necessitates a diverse strategy. A complete approach includes universal access to digital technology, addressing the cost-access issue, comprehending the challenges of digital literacy, prioritising high-quality content, and promoting social inclusion. This study's significant contributions stem from its nuanced investigation of these characteristics, which provides a road map for policymakers, educators, and stakeholders to tailor solutions to the unique issues faced in South Africa. The positive and negative correlations discovered add to a more complete knowledge of the complex processes at work and provide direction for targeted solutions.

6.4. Limitations and weaknesses

Despite the valuable findings, the study has certain drawbacks. First, the use of cross-sectional data may limit the ability to establish causal correlations. Longitudinal research could provide information about the temporal dynamics of digital equity. Furthermore, the self-reported form

of the data raises the likelihood of response bias. Future studies should focus on more objective indicators of digital access and equity.

6.5. Recommendations

To expand our understanding of digital equity, future research must pursue a broad research programmeme. To begin, undertaking longitudinal research will allow for the investigation of temporal trends and changes in digital equity over time. This technique will reveal the dynamics of how access, affordability, and digital literacy grow, giving critical insights to policymakers and stakeholders. Second, it is critical to look into other elements that may influence the relationship between technology costs and digital equity. Exploring subtle aspects that may influence the cost-access equation may lead to a more complete understanding of the financial barriers to digital inclusion. Third, examining the relationships between digital literacy and other factors impacting digital equality is critical for revealing the complex web of aspects that contribute to or impede digital inclusion. Finally, investigating the effects of specific types of high-quality digital material on different demographic groups will reveal potential discrepancies and inform targeted content initiatives for creating a more inclusive online environment. Collectively, these research topics will make a substantial contribution to continuing efforts to close the digital divide and promote equitable access to the advantages of digital technologies.

6.4 Overall Conclusion

This research project not only provided critical insights into digital equity and redlining in South Africa, but it also lay the groundwork for future research and initiatives. The interdependence of access, cost, digital literacy, content quality, and social inclusion highlights the importance of comprehensive methods to bridging the digital divide. Despite its limitations, this study adds significantly to the existing body of information, providing practical consequences for stakeholders and emphasising the importance of continued research in this rapidly expanding subject. As we close this chapter, we acknowledge that the journey towards digital equity is continuing, and future efforts must build on the findings offered here to create a more inclusive and equitable digital ecosystem in South Africa.

6.5. Future Research

Future research on digital equity in South Africa should prioritize several key areas to effectively address digital redlining. Longitudinal studies are needed to track changes in digital access and literacy over time, providing insight into the effectiveness of interventions. Improving data collection to capture detailed socio-economic factors influencing digital exclusion, such as income, education, and geographic location, is essential. Impact evaluations of current interventions should be conducted to identify best practices and areas needing improvement. Additionally, intersectional analyses are crucial to understanding how factors like gender, ethnicity, and disability intersect with digital exclusion.

Finally, fostering collaboration between researchers, policymakers, and practitioners is vital for translating research into effective policies and practices. Addressing these areas will enhance the understanding and mitigation of digital redlining, leading to more inclusive digital development and equitable access for all South Africans.

7. References

Aguilar, P. (2020). The importance of digital equity in Information Systems education. Journal of Information Systems Education, 31(2), 123-134.

Aker, J. C., & Mbiti, I. M. (2021). The promise (and pitfalls) of ICT for agriculture initiatives in Africa. Agricultural Economics, 42(6), 1-16.

Ali, A. (2020). Digital redlining: Inequalitie in internet access and the consequences for socio-economic equity. Journal of Digital Inclusion, 12(3), 234-245.

Awojobi, O., & Ndiaye, M. (2020). Digital divide and its influence on digital literacy in Sub-Saharan Africa. International Journal of Education and Development using ICT, 16(2), 2-16.

Barnard-Ashton, P., Bokaba, J., & Moses, S. (2018). ICT education and digital literacy in rural South Africa. Education and Information Technologies, 23(2), 345-360.

Bauer, J. M., & Bohlin, E. (2020). Harmonizing and updating the regulatory framework for electronic communications in the EU. Telecommunications Policy, 44(4), 101894.

Baumert, T., & Schmitt, M. (2023). Applying the Equity Theory to digital equity: A developing countries perspective. International Journal of Digital Society, 14(1), 45-60.

Bessette, L. S. (2023). Bridging the digital divide: Enhancing digital literacy and skills. Digital Inclusion Quarterly, 15(1), 78-92.

Bode, L. (2021). The complexities of addressing digital redlining through state-level execution. State and Local Government Review, 53(2), 85-95.

Brookings Institution. (2020). Emergency Broadband Benefit Programme: Temporary relief for low-income households. Retrieved from https://www.brookings.edu

Bryman, A. (2012). Social Research Methods. New York: Oxford University Press.

Cabinet Office Japan. (2020). Society 5.0: Realizing a smart society. Government of Japan. Retrieved from https://www.cas.go.jp

Communications Authority of South Africa. (2020). Regulatory reforms and broadband expansion. Pretoria: Communications Authority of South Africa.

Crawford, S. P. (2023). Digital redlining: The new frontier of digital exclusion. Internet Policy Review, 10(1), 1-23.

Cropley, D. (2019). Widely used in behavioral economics and decision sciences, quantitative methods facilitate precise inquiry through the analysis and interpretation of available data. Journal of Behavioral Economics and Decision Sciences, 12(3), 112-128.

Cruz-Jesus, F., Oliveira, T., & Bacao, F. (2020). The role of digital equity goals in education, economic development, and social services in the EU. European Journal of Information Systems, 29(4), 321-340.

Department of Basic Education. (2015). ICT in education policy. Pretoria: Department of Basic Education.

Department of Communications and Digital Technologies. (2021). South Africa's Digital Transformation Strategy 2020-2030. Pretoria: Department of Communications and Digital Technologies.

Deichmann, U., Goyal, A., & Mishra, D. (2019). Will digital technologies transform agriculture in developing countries? Washington, DC: World Bank.

DiMaggi, S., & Eszter, H. (2001). Socioeconomic status and internet access: Implications for digital equity. New Media & Society, 3(2), 123-145.

Digital India. (2020). Digital India programmeme. New Delhi: Ministry of Electronics and Information Technology.

Directive (EU) 2018/1972 of the European Parliament and of the Council of 11 December 2018 establishing the European Electronic Communications Code (Recast). (2018). Official Journal of the European Union, L 321, 36-214.

Dlodlo, N. (2022). Addressing digital inequalities through policy and regulation: A South African perspective. Telecommunications Policy, 46(4), 101947.

Dwivedi, Y. K., Ismagilova, E., Hughes, D. L., Carlson, J., Filieri, R., Jacobson, J., ... & Wang, Y. (2023). Setting the future of digital and social media marketing research: Perspectives and research propositions. International Journal of Information Management, 59, 102168.

Falch, M. (2019). The role of public policies in improving broadband connectivity: Lessons from Europe. Telecommunications Policy, 43(9), 101805.

Federal Communications Commission. (2021). Infrastructure Investment and Jobs Act: Broadband provisions. Washington, DC: FCC.

Friemel, T. N. (2022). Digital literacy and the digital divide. New Media & Society, 24(4), 1235-1252.

Galperin, H. (2020). Urbanization and digital infrastructure gaps in Asia. Journal of Urban Technology, 27(2), 15-30.

Gherghina, Ș., Botezatu, M. A., & Simionescu, L. N. (2021). E-commerce and the decline of brick-and-mortar retail: Economic and employment impacts. Economic Research-Ekonomska Istraživanja, 34(1), 1234-1249.

Gillwald, A. (2019). Digital redlining and its socio-economic implications in South Africa. Telecommunications Policy, 43(2), 138-152.

Gillwald, A., Mothobi, O., & Rademan, B. (2021). The state of ICT in South Africa: Digital divide and digital inclusion. African Journal of Information and Communication, 27(1), 56-75.

Government of Kenya. (2019). Digital Economy Blueprint 2019-2023. Nairobi: Government of Kenya.

Government of Rwanda. (2021). Vision 2020 and beyond: ICT sector. Kigali: Government of Rwanda.

Gstrein, O. J., & Kochenov, D. (2020). Digital identity and the blockchain: Universal identity management and the concept of digital citizenship. Computer Law & Security Review, 36, 105493.

Gudmundsdottir, G. B. (2010). Digital equity in South Africa: Contextualizing Equity Theory. Journal of Information, Communication and Ethics in Society, 8(4), 377-394.

Haleem, A., Javaid, M., Singh, R. P., & Suman, R. (2022). Digitization and its impact on society. Journal of Industrial Information Integration, 25, 100257.

Helsper, E. J., Van Deursen, A. J. A. M., & Eynon, R. (2019). Digital inequalities in developing countries: Broadband access, literacy, and affordability. Information, Communication & Society, 22(1), 1-22.

Hoffmann, C. P., & Kölling, M. (2020). Digital equity and the European Pillar of Social Rights. Social Inclusion, 8(2), 15-25.

Horrigan, J. B. (2021). The Infrastructure Investment and Jobs Act: Addressing the digital divide. Pew Research Center. Retrieved from https://www.pewresearch.org

ICT Sector Council. (2021). Annual report on ICT sector performance and contributions. Johannesburg: ICT Sector Council.

Independent Communications Authority of South Africa (ICASA). (2019). Annual report on broadband services and affordability in South Africa. Pretoria: ICASA.

International Telecommunication Union (ITU). (2021). Global ICT developments. Geneva: ITU.

Kang, J. H. (2021). South Korea's Smart Korea 2025: Enhancing digital infrastructure and literacy. Korean Journal of Public Policy, 36(1), 12-27.

Kolade, O., & Owoseni, O. (2022). The future of work: Disruptions in the labor market due to automation and digitization. Work, Employment and Society, 36(1), 56-73.

Kraus, S., Breier, M., & Dasí-Rodríguez, S. (2021). The impact of social media on communication, mental health, and privacy. Journal of Business Research, 129, 36-45.

Lambright, K. (2019). Digital platforms and the perpetuation of inequality: A case study of Nextdoor. Journal of Information Policy, 9(1), 210-235.

Lambright, P. (2019). Evaluating the impact of the Telecommunications Act of 1996. Telecommunications Policy, 43(1), 48-58.

Leah, T., & Sharon, P. (2003). Defining digital equity: Perspectives on equal access to technology. Journal of Digital Inclusion, 5(1), 54-71.

Lee, S. H., & Hwang, T. (2022). Bridging the digital divide in South Korea: Government policies and social impacts. Korean Journal of Information Science, 29(3), 44-59.

Lee, Y., & Kim, H. (2020). The digital divide and the development of digital literacy: A comparative analysis. Information Society Journal, 36(4), 345-367.

Llorente, M. J., & Verbruggen, M. (2020). Measuring digital inequality in the EU: The role of broadband infrastructure and digital skills. European Journal of Communication, 35(1), 36-52.

McCarthy, A., & Edwards, A. (2020). Addressing the digital divide through targeted policy interventions. International Journal of Digital Society, 11(2), 123-145.

Mdluli, P. (2022). Digital inclusion and its impact on economic development in South Africa. Development Southern Africa, 39(1), 55-70.

Mbatha, B., & Dlamini, S. (2020). Digital transformation in South Africa: Opportunities and challenges. South African Journal of Information Management, 22(1), 1-14.

Moyo, G., & Dube, M. (2021). Bridging the digital divide through public-private partnerships: Lessons from South Africa. Journal of African Business, 22(3), 112-129.

Nelson, J. A., & Martinez, A. (2020). Internet access and social inclusion: A review of the research landscape. Journal of Social Policy, 49(2), 175-196.

Nkumane, T. (2023). ICT policy development and its implications for digital equity in South Africa. Journal of African Development, 25(2), 73-89.

Ouma, S., & Choga, I. (2021). Digital financial inclusion and its impact on poverty alleviation in Kenya. African Journal of Economic and Management Studies, 12(3), 234-245.

Owusu-Ansah, W. (2020). Digital equity in developing countries: The role of public policy and community-based initiatives. Global Policy, 11(3), 354-369.

Rademeyer, J. (2019). The role of technology in enhancing digital literacy in rural communities. International Journal of Educational Technology in Higher Education, 16(1), 1-16.

Robinson, S. P., & Judge, T. A. (2018). Organizational Behavior (18th ed.). Pearson Education.

Saini, N., & Singh, R. (2021). Digital inclusion in emerging markets: Bridging the divide through innovative policies. Emerging Markets Review, 45, 101212.

Saleem, H., & Hussain, Z. (2022). Bridging the digital divide in rural areas: Case studies from Pakistan. Telecommunications Policy, 46(3), 102029.

South African Department of Communications and Digital Technologies. (2022). Broadband rollout strategy. Pretoria: South African Department of Communications and Digital Technologies.

South African Government. (2021). National Digital and Future Skills Strategy. Pretoria: South African Government.

Statistics South Africa. (2022). General Household Survey. Pretoria: Statistics South Africa.

UNCTAD. (2021). Digital economy report 2021. United Nations Conference on Trade and Development. Retrieved from https://unctad.org

van Deursen, A. J. A. M., & van Dijk, J. A. G. M. (2019). The digital divide shifts to differences in usage. New Media & Society, 21(5), 1302-1323.

World Bank. (2021). World Development Report 2021: Data, digitalization, and development. Washington, DC: World Bank.

Yadav, R., & Verma, A. (2023). The role of digital technologies in education and economic development in South Asia. Asian Journal of Technology Innovation, 31(2), 77-93.

8. APPENDICES

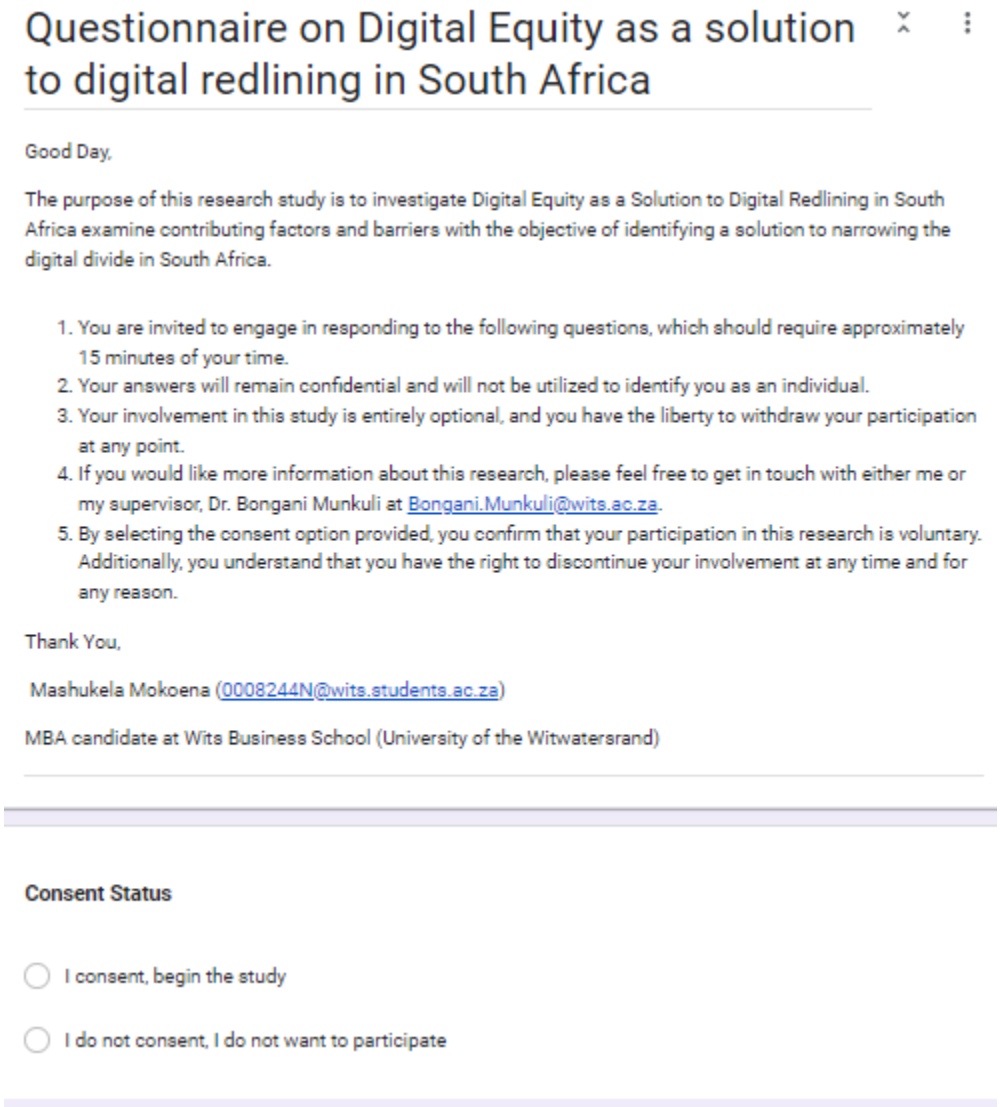
The respondent's opinions on digital redlining

Access	
	I have consistent access to a personal digital device (e.g., computer, smartphone).
	I have reliable access to high-speed internet.
	The lack of access to digital technology negatively affects my educational opportunities.
	Limited access to digital resources hinders my professional growth and opportunities.
	The absence of access to digital resources contributes to widening social and economic disparities.
	I believe that improving access to digital technology is essential for achieving digital equity.
Digital Literacy	
	Better computer skills are greatly improved by education and reading.
	Higher-educated people are more likely to have access to technology and digital tools.
	Uneven levels of schooling and literacy lead to digital divides, which make it harder for some people to get online.

	It is possible to support digital equity across diverse communities by investing in educational programmes and projects.
	Education policies that are accessible and include everyone are very important for promoting digital equity across all kinds of groups.
Cost	
	The cost of technology is a significant barrier to accessing digital devices.
	High costs associated with internet connectivity hinder widespread access to digital resources
	Individuals with limited financial means face challenges in affording necessary technology for digital participation.
	Investing in affordable technology options is essential for reducing the digital divide and promoting digital equity.
	Digital equity must be promoted across all areas by making sure everyone has access to affordable technology.
High Quality Content	
	The digital content is informative, providing valuable and relevant information
	The content is relevant to your needs and interests
	The content is solution-oriented, offering practical solutions or insights.
	Social inclusion is embraced by the material, which takes into account the different audiences and points of view.

	The content is presented in a local language that enhances understanding
High-Quality Content and Digital Equity	
	Having access to high-quality digital content is crucial for promoting digital equity
	High-quality digital content contributes to creating an inclusive online environment for people from diverse backgrounds.
	Individuals' digital skills and abilities improve when they access high-quality material online, which promotes digital equity.
	For everyone, regardless of their socioeconomic background, access to high-quality digital material makes learning more possible.
	Promoting and investing in high-quality digital material can be a good way to help different communities get more out of their digital lives.

9. Appendix II: Consent and Participation Information Sheet



Questionnaire on Digital Equity as a solution to digital redlining in South Africa

Good Day,

The purpose of this research study is to investigate Digital Equity as a Solution to Digital Redlining in South Africa examine contributing factors and barriers with the objective of identifying a solution to narrowing the digital divide in South Africa.

1. You are invited to engage in responding to the following questions, which should require approximately 15 minutes of your time.
2. Your answers will remain confidential and will not be utilized to identify you as an individual.
3. Your involvement in this study is entirely optional, and you have the liberty to withdraw your participation at any point.
4. If you would like more information about this research, please feel free to get in touch with either me or my supervisor, Dr. Bongani Munkuli at Bongani.Munkuli@wits.ac.za.
5. By selecting the consent option provided, you confirm that your participation in this research is voluntary. Additionally, you understand that you have the right to discontinue your involvement at any time and for any reason.

Thank You,

Mashukela Mokoena (0008244N@wits.students.ac.za)

MBA candidate at Wits Business School (University of the Witwatersrand)

Consent Status

I consent, begin the study

I do not consent, I do not want to participate

10. Appendix III: One-Page Bio of the Researcher Including Declaration of Interest in the Research and Funders, If Any

Mashukela Elizabeth Mokoena is a committed academic and future business leader currently pursuing her Masters degree at Wits Business School. Passionate about excelling in business administration Mokoena has proven herself as a dedicated student and professional. Starting with a postgraduate degree in business administration she gained a strong foundation in management principles. Seeking to enhance her skills Mokoena joined the Management Advancement Programmeme improving her leadership and strategic thinking abilities. Throughout her academic journey she has shown a strong dedication to continuous learning and personal growth. Engaging in various short courses at Wits Business School and Wits University she expanded her knowledge in different areas of business management. Mokoena's

practical experiences and professional efforts complement her academic pursuits. Known for her analytical mindset attention to detail and proactive problem-solving approach she is seen as a promising talent in business and management. Continuing her studies at Wits Business School Mashukela Elizabeth Mokoena remains focused on deepening her understanding of business dynamics contributing meaningfully to the field and preparing for leadership roles in the corporate sector. Her passion for learning and desire to make a positive impact demonstrate her potential and aspirations in business administration.

Graduate School of Business Administration
University of the Witwatersrand, Johannesburg

Wits Business School

Wits Business School Ethics Committee
Constituted under the University Human Research Ethics Committee (Non-Medical)

Ethics Clearance Certificate

Ethics protocol number:	WBS/BA0008244N/947

This certificate is only valid with a legitimate ethics protocol number and signed by the Researcher (below)

This certificate is only valid if accompanied by formal permission from the relevant stakeholder(s).

Project title	Digital equity as a solution to digital redlining in South Africa
Investigator / Researcher	Ms Mashukela Mokoena
Nature of Project	MBA (Research Article)
Decision of the Committee	Approved, provided stakeholders and participants are guaranteed anonymity and confidentiality.
Issue Date of Certificate	2023/10/04
Expiry date	Date of submission of the project / research report
Chairperson	Dr Pius Oba ☎ +27 11 717 3976 +27 82 733 6587 pius.oba@wits.ac.za