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Minor Dissertation

Research Title:

ICT Policies' Implementation to Promote Access, Equity, and Quality in South African Higher Education

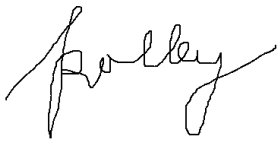
Submitted in the partial fulfilment of the requirements of the Master of Education (MEd) by coursework and research at
The University of the Witwatersrand

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Declaration

I, **Moegammat Faiek Dolley**, certify that this research report is original, except where citations and acknowledgements indicate otherwise. I also certify that the minor dissertation entitled: **ICT Policies' Implementation to promote access, equity, and quality in South African Higher Education,** is my own work.



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1

Acknowledgement

I thank Almighty Allah, who throughout the tenure of my studies has bestowed me with His beneficence and mercy to complete this study successfully.

I am eternally grateful to my wife, family and friends for the psychological, moral, and spiritual support that they rendered to me - I could not have reached this far without them.

To all my lecturers and classmates, I am genuinely thankful for the various roles that you played in supporting me to traverse this academic terrain. I am especially indebted to my supervisor, Dr NS Ndlovu, for patiently assisting me to shape this study into a coherent report.

Dedication

This study is dedicated to all the academics and support staff, who remain resilient in the face of countless challenges. Thank you for your unwavering commitment to eliminating epistemic injustice.

Abstract

While higher education institutions have increasingly adopted technology for teaching and learning activities, the digital gap has widened and has excluded many from participating in the global economy. Policies are pivotal in providing guidelines for technology adoption for increased access, equity and quality.

In South Africa, Information and Communication Technology (ICT) policies in higher education aimed to improve access, equity, and quality. The government supported these efforts by funding ICT infrastructure, including high-speed internet, digital libraries, and online learning platforms. Institutions developed their own ICT strategies, integrating technology into curriculum design, delivery, and research. E-learning and distance education programs were introduced to reach students in remote areas. Additionally, training programs were provided to educators to enhance their ICT skills, ensuring high-quality education through technology.

This study aimed to investigate the national policies of South Africa to establish how they envision the role of technology in promoting access, equity and quality in higher education in South Africa. To achieve this aim, the study employed qualitative methods to explore the policy-related practices of participants from four higher education institutions in South Africa. By analysing policy documents and interviewing participants from the selected higher education institutions, this study identified practices and approaches that HEIs can adopt to address the policy-related gaps in terms of achieving access, equity and quality in the adoption of technology for teaching and learning. The two theories that were used to form the conceptual framework of this study are Hanson and Holmberg's (2003) model, which describes what policies consist of, and Sutton and Levinson's (2001) socio-cultural approach to educational policy. This research interrogated how ICT policies advocate for strategies that can overcome access restrictions and inequalities, while promoting quality in teaching and learning practices. The following are examples of practices that were viewed as increasing technology access, equity and quality in education; grant-funded projects to increase access to marginalised groups, epistemological access to underserved students, Open Education Resources (OER) development, micro credentialing and student tracking. In the implementation of HE policies, support and training in the usage of technology by lecturers was identified as a practice that can increase and sustain the adoption of technology for learning and teaching to the benefit of all.

Keywords: Access, equity, equality, implementation, policies.

List of acronyms and abbreviations

COVID-19	Corona-virus disease of 2019
HEI	Higher Education Institution
LMS	Learning Management System
DST	Department of Science and Technology
NPC	National Planning Commission
ERT	Emergency Remote Teaching
ICTs	Information Communication Technologies
NSFAS	National Students Financial Aid Scheme
DHET	Department of Higher Education and Training

Table of figures

Figure1: European ICT Policies for Educational systems

Figure 2: The research onion

Figure 3: Thematic Analysis Framework

List of Tables

Table 1 Phases of thematic analysis

Table 2 Summary of Key Findings of two datasets

Table of Contents

Declaration 2
Acknowledgement 4
Dedication 5
Abstract 6
List of acronyms and abbreviations 7
Table of figures 8
List of Tables 8
Chapter 1: Introduction 12
1.0 Introduction 12
1.1 Background of the study 14
1.2 Problem Statement 16
1.3 Purpose statement 17
1.4 Research Objectives 17
1.5 Research question 17
1.5.1 Main question 17
1.5.2 Sub question 17
1.6 Rationale of the study 18
1.7 Conclusion 18
Chapter 2: Literature review 19
2.0 Introduction 19
2.1 Literature review 19
2.1.1 Access to Education: massification of higher education 19
2.1.2 Policy redress 20
2.1.3 Policy developments 20
2.1.4 Policies for access, equity and quality 22
2.1.5 HEIs' institutional policy responses to access, equity and quality 31
2.2 Theoretical framework 32
2.3 Conclusion 35
Chapter 3: Methodology 36
3.0 Introduction 36
3.1 Research philosophy 36
3.2 Approach to theory development 37
3.3 Methodological choice 37

3.4 Research strategy 38
3.5 Time horizon 38
3.6 Techniques and procedures 39
3.6.1 Data collection methods 39
3.6.2 Data analysis methods 41
3.6.3 Secondary data analysis (SDA) 43
3.6.4 Population and sampling techniques 45
3.7 Ethical considerations 45
3.8 Conclusion 45
Chapter 4: Presentation and analysis of findings 47
4.0 Introduction 47
4.1 Presentation and analysis of policy documents 47
4.1.1 Access and policy documents 47
4.1.2 Equity and policy documents 50
4.1.3 Quality and policy documents 52
4.2 Description of the case study institutions 53
4.3 Presentation and analysis of focus group interviews 55
4.3.1 Implementing access through policies for funding 55
4.3.2 Use of technology by HEIs to promote access, equity, and quality 61
4.3.3 Challenges with using technology 65
4.3.4 Support and training needed to use technology 66
4.4 Conclusion 71
This chapter provided an analysis of the policy documents related to educational technology, as well as an analysis of focus group interviews data that were gathered from DHET and four public universities. 71
Chapter 5: Summary and discussion of the findings 73
5.0 Introduction 73
5.1 Overview of the key findings of the study 73
5.1.1 Findings from policy documents 73
5.1.2 Findings from focus group interviews 74
5.2 Discussion 77
5.2.1 ICT Policies' implementation to promote access, equity, and quality 77
5.3 Conclusion 83
Chapter 6: Conclusions and recommendations 84
6.0 Introduction 84
6.1 Limitations of the study and suggestions for future studies 84

6.2 Conclusion 84
6.3 Recommendations 85
7.0 References 89
8.0 Appendices 101
Appendix A: Ethical Clearance Certificate of Primary study 101

Chapter 1: Introduction

1.0 Introduction

Higher education plays a crucial role in shaping future leaders and addressing global societal challenges by providing innovative solutions that foster peace and prosperity. However, historical constraints have often hindered the effective functioning of higher education institutions. Affirmative action policies have been implemented in many countries to enhance access and redress historical discrimination, thereby empowering disadvantaged groups through social transformation and the recognition of potential (McCowan, 2016). For instance, in the United States, access and success in higher education are closely linked to the broader struggle for personal freedom and equality, and technology plays a pivotal role in advancing such objectives (Walter, 2005).

In Europe, efforts to increase inclusivity in higher education have been supported by technology-driven initiatives. De Benedictis and Leoni (2021) highlight low participation rates of students with special needs in the Erasmus Programme and, therefore, they propose an inclusiveness index for universities. Additionally, Turkanović et al. (2017) introduce EduCTX, a blockchain-based global higher education credit platform designed to create a decentralised system for managing educational credits, enhancing transparency and accessibility for students and institutions worldwide.

Ghanaian policies have been crafted to facilitate access for female students from underprivileged secondary schools through the provision of bursaries and addressing historical gender-based disparities (Atuahene & Owusu-Ansah, 2013). However, widening participation does not always translate to equitable opportunities for disadvantaged students (McCowan, 2016). Technology access serves as a crucial medium for ensuring inclusive education. This is evident in a study by Harle et al. (2021), which showcases the potential of digital learning in promoting access and equity in higher education across Ghana, Kenya and Nigeria.

The South African government has firmly established policies aimed at expanding access, ensuring equity, and transforming higher education (Mzangwa, 2019; Leibowitz & Bozalek, 2014). Post-1994, the policy developments in the country emphasised the role of higher education in fostering social inclusivity and national development. The 1997 White Paper on Education called for massification, increased access, and “the development of a knowledge economy through enhanced technology use” (Department of Education, 1997). Furthermore, the 1995 National Qualifications Framework established learning outcomes as the guiding principle for achieving qualifications, thereby aligning education with global economic demands (SAQA, 1995; Kraak, 2000).

Despite the abovementioned efforts, South Africa's educational landscape remains uneven, with economic barriers still limiting access for disadvantaged students. Race and class continue to serve as primary indicators of disadvantage (Leibowitz & Bozalek, 2014). Leibowitz and Bozalek (2014) argue that inequality is more closely linked to race than gender, social class, or ability. Nonetheless, significant progress has been made in increasing Black student enrolment. Effective Information Communications Technology (ICT) integration can support large-class management, innovative curriculum design, and flexible learning models (Jaffer et al., 2007).

Funding remains a critical factor in implementing redress measures for underserved student populations. Initiatives such as Extended Curriculum Programmes and the NSFAS funding policy aim to broaden access and promote success. However, Badat (2010) contends that insufficient funding has been allocated to NSFAS loans, thus, limiting the effectiveness of these efforts (Leibowitz & Bozalek, 2014).

While policy documents emphasise access, equity, and quality, they often overlook the transformative potential of technology in achieving these goals. ICT can foster inclusivity by increasing access, enhancing quality through collaborative learning environments, and promoting equity by accommodating diverse student needs.

Globally, ICT policies have been instrumental in bridging the digital divide, enhancing digital literacy, and ensuring that higher education is accessible to all; policies that

include initiatives to improve internet infrastructure, provide affordable access to digital devices, and integrate digital skills training into educational curricula. Policy frameworks provide the foundation for ICT integration in higher education, thereby expanding social benefits, enriching curricula, and increasing learning flexibility (Cross & Adam, 2007). This study examined key higher education policy documents to assess their advocacy for technology-driven solutions in enhancing access, reducing inequalities, and improving educational quality.

1.1 Background of the study

Access to higher education in South Africa has evolved through three distinct phases: discriminatory access, equality of access, and equity of access (McCowan, 2016). Affirmative action and positive discrimination policies have challenged traditional admission criteria based on perceived merit. Despite these interventions, race and class remain the primary factors influencing exclusion from higher education, with poverty disproportionately affecting African populations (Leibowitz & Bozalek, 2014).

The implementation of higher education policies aimed at transformation has yet to fully achieve social inclusion (Leibowitz & Bozalek, 2014). Historically, South African higher education was structured along racial lines, with colonialism and apartheid shaping access policies (Soudien, 2008). The apartheid-era division led to the establishment of Historically Black Institutions (HBIs) and Historically White Institutions (HWIs), with HBIs serving as centres of resistance against apartheid. By 1994, the new democratic government inherited a fragmented higher education sector that was plagued by inefficiencies and low-quality outputs (CHE, 2004). Consequently, transformation policies were introduced to reduce inequalities and restore public confidence in the sector (CHE, 2004).

ICT is widely regarded as a catalyst for broadening access and enhancing the quality of higher education in South Africa. The rationale for integrating ICT into higher education includes its essential role in contemporary society, the necessity of ICT skills for various vocations, and its ability to facilitate pedagogical innovations such as e-learning and blended learning (Cross & Adam, 2007). The Department of Higher Education and Training (DHET) (2013) advocates for equitable access to blended

learning, ranging from supplemental online content to fully online courses. Virtual learning environments offer alternative avenues for accessing higher education institutions (HEIs), supporting inclusivity and pedagogical efficiency (Park & Van der Merwe, 2009). Effective ICT integration in education that is aligned with institutional learning outcomes rather than serve as an independent technological layer (ibid) has a potential to cater for all and be used to enhance teaching and learning.

Successful ICT implementation requires coordinated efforts from the government, educational institutions, and regulatory bodies (Cross & Adam, 2007). The government should ensure infrastructural support, while HEIs must build human capacity for the design and delivery of digital learning content. According to Sesemane (2007), the draft White Paper on Education (2004) positions higher education institutions as the custodians of ICT implementation in South Africa. Furthermore, the integration of ICT into education aligns with global Sustainable Development Goals (SDGs). SDG 4 aims to ensure inclusive and quality education, particularly for marginalised groups, through ICT-enhanced learning, while SDG 16 emphasises the role of ICT in fostering social stability and peace. Consequently, the formulation of ICT policy in South Africa must consider broader socio-economic and transformational imperatives alongside technological advancements (Cross & Adam, 2007).

The COVID-19 pandemic accelerated the adoption of ICT in education, consequently reinforcing the role of Learning Management Systems (LMS) and other digital platforms. During this period, emergency remote teaching (ERT) became a viable alternative to sustain learning (Jili, Ede & Masuku, 2021). The effectiveness of ERT in South Africa depended on several factors, including technological infrastructure, political and administrative climate, ICT-friendly policies, socio-economic accessibility, geographic reach, and disciplinary constraints related to practical courses (Jili et al., 2021).

This study sought to investigate how ICT policies' implementation in South African higher education influences access, equity, and quality in education. The policies that were studied are: White Paper 3 of 1997, the National Plan for higher education 2001, The CHE Annual Report 2000/2001, The report 'Implications of the 4th Industrial Revolution for the Post-School Education and Training System (PSET)' 2020, The White Paper for Post-School Education and Training 2013, The Policy for the Provision

of Distance Education in South African Universities 2014, The Distance Higher Education Programmes in a Digital Era: Good Practice Guide 2014, The Policy for the Provision of Distance Education in South African Universities, DHET (2014), The Distance Higher Education Programmes in a Digital Era: Good Practice Guide, CHE (2014). By examining the role of ICT in addressing historical disparities and enhancing learning opportunities, the aim of this research was to provide insights into policy effectiveness and areas for improvement in achieving equitable higher education outcomes.

1.2 Problem Statement

The COVID-19 pandemic exposed significant disparities in the implementation of emergency remote teaching (ERT), particularly in South Africa's higher education sector. Among the key concerns were issues of access and equity, as students from socioeconomically disadvantaged backgrounds struggled with poor internet connectivity, inadequate home learning environments, and limited digital literacy (Kara, 2021). Additionally, challenges such as lack of online pedagogical skills among educators, difficulties in adapting practical courses to digital formats, and insufficient quality assurance mechanisms further exacerbated these inequalities.

The shift to online learning during the pandemic highlighted the increasing role of ICTs in higher education. Learning management systems (LMS) and social media platforms became essential tools for communication and instruction (Maphalala & Adigun, 2020; Turnbull et al., 2021). However, historical inequalities in South Africa's education system, rooted in apartheid-era segregation, continue to shape disparities in access to quality higher education. Historically disadvantaged institutions, which serve predominantly Black students, often lack the infrastructure and resources that are necessary for supporting large-scale digital learning (Soudien, 2008).

These inequities are further emphasised in the Department of Higher Education and Training's (DHET) 2013 "White Paper for Post-School Education and Training", which promotes e-learning, but acknowledges the persistent barriers that are faced by marginalised groups, including women, those with disabilities, and students from rural areas. While the government has expressed the need for collaborative efforts to

bridge these gaps, the practical implementation of ICT-driven education policies remains inconsistent.

This study sought to critically examine how ICT policies in South African higher education address the challenges of access, equity, and quality. By analysing policy frameworks and institutional responses, the research aimed to provide insights into how higher education institutions (HEIs) could better implement technology-driven solutions to promote inclusive and high-quality education. The findings of this study may contribute to policy recommendations that support more effective integration of ICTs in higher education, ultimately fostering greater social and economic transformation.

1.3 Purpose statement

The purpose of this study was to investigate how ICT policies in South African higher education address the challenges of access, equity, and quality through technology implementation.

1.4 Research Objectives

The proposed research objective is to:

• Identify best practices of implementing the use of technologies for promoting equity, access, and quality in South African HEIs.

1.5 Research question

1.5.1 Main question

How does ICT policies' implementation promote access, equity, and quality in higher education institutions (HEIs) in South Africa?

1.5.2 Sub question

1. What are the best practices to promote access, equity and quality amongst HEIs in South Africa?

1.6 Rationale of the study

The implementation of Information and Communication Technology (ICT) policies in higher education is crucial for promoting access, equity, and quality, particularly in South Africa, where historical inequalities still have an impact on education. This study is essential for several reasons. South Africa faces significant disparities in access to technology and the internet, particularly between urban and rural areas. The disparities in ICT access between urban and rural areas in South Africa highlight the need to address the digital divide in order to ensure equitable educational opportunities (Govender, 2024). Investigating ICT policy implementation can help stakeholders to assess whether current strategies effectively bridge the digital divide and support underprivileged students.

Despite existing ICT policies, challenges such as poor infrastructure, inadequate funding, and lack of digital skills hinder their full implementation (Czerniewicz et al., 2006). The study will explore these challenges and provide recommendations for improving ICT policy execution. By conducting this study, policymakers, educators, and stakeholders will gain insights into how ICT policies could be refined and strengthened to promote access, equity, and quality in higher education in South Africa.

1.7 Conclusion

Chapter 1 outlined the background of the study, the problem statement and the purpose of the study. The research objectives and questions, as well as the rationale of the study, were also stated. The following chapter focused on the review of related literature and the discussion of the theoretical frameworks that guided this study.

Chapter 2: Literature review

2.0 Introduction

The literature review chapter outlines the massification of higher education and interrogates the resultant increased access and its implications to fair access. This chapter further discusses the effectiveness of equitable access policies in redressing apartheid era policies. The milestones in policy developments for higher education are also reviewed. The chapter then presents a summary of the policies that specifically pertain to access, equity and quality issues. Finally, the chapter describes institutional policies and how they generally respond to the aforesaid three issues, aligned to the objective of the study, which sought to determine how HE policies promote access, equity, and quality in education.

2.1 Literature review

2.1.1 Access to Education: massification of higher education

Access, equity, and quality in education are common themes in the provision of higher education internationally. Across the globe the democratisation of higher education leads to tensions between the quality of education and massification of higher education (Hornsby & Osman, 2014). Further, technology plays a role in providing an engaging environment in large classes, which promotes higher-order thinking skills (ibid). According to policy perceptions, large class teaching arguably leads to increased graduate numbers, in spite of fewer resources, yet this still leaves much to be interrogated.

The massification of higher education comes with many challenges and opportunities in both the South African and international contexts. Badat (2010) states that an enabling policy framework for higher education must be supported by state funding. Physical access to higher education may have been increased, but much is left to be desired as far as access to quality education is concerned (CHE, 2014). The use of technology in this case can strain or promote access to quality education, depending on the environmental issues that are captured in policies and implemented at institutional level.

2.1.2 Policy redress

In South Africa, the agenda of redressing the inequalities that resulted from the apartheid regime was first articulated in the Education White Paper (1997), which argues for the advancement of Black and women students in the fields of Science, Technology, Engineering and Mathematics (STEM). However, this policy lacked guidance on how or with what technology this social transformation would take place. Four years later, the National Plan for Higher Education (DHET, 2001) was instituted to bridge the gap between policy promulgation and implementation. ICT is regarded as an effective tool for bridging educational disparities by providing flexible learning opportunities. The government's South Africa Connect policy aims to provide broadband access to all citizens, including educational institutions, to enhance digital learning opportunities. However, challenges such as infrastructure limitations and unequal access to technology persist, particularly in rural areas (Isaacs, 2007). Equitable access to digital resources is crucial for addressing historical inequalities in South Africa. A recent study highlighted significant gaps in institutional policies related to digital access for differently abled students, thus, underscoring the need for more inclusive ICT strategies (Zongozzi & Ngubane, 2025). Additionally, mobile technology is recognised as one of the tools for reducing inequality, especially in developing communities (Mkuzo & Govender, 2025).

The integration of ICT in higher education can potentially enhance the quality of learning and teaching. A recent publication focused on the state of ICT integration in African higher education and highlighted that the COVID-19 pandemic had accelerated the adoption of digital technologies, leading to innovative teaching practices and improved educational outcomes (Aricindy et al., n.d.). However, the effectiveness of these technologies depends on adequate infrastructure, faculty training, and supportive institutional policies.

2.1.3 Policy developments

Due to the unlevelled playing fields for all races in the higher education landscape, South Africa implemented initiatives like the University Capacity Development Programme (UCDP) (DHET, 2020) to advance the transformation agenda. The UCDP is an infrastructural support programme that is designed to facilitate the provision of resources like ICT to provide equitable, quality education to all students. After the

publication of The National Plan for Higher Education policy, universities increased online offerings in order to increase boost their enrolment figures, instead of using technology to increase success rates among the disadvantaged students.

In the White Paper for Post-School Education and Training (DHET, 2013) the then minister of Higher Education stressed that it was crucial to improve the quality of education through Open Educational Resources (OERs) and open-source software. In general terms, issues related to redressing the legacy of apartheid are referred to as equity in policies. Through the White Paper for Post-School Education and Training (DHET, 2013), the government also aims to ensure that the use of technology, as a primary means of delivery of education, is equitably accessible. The DHET foresees that collaboration with the Department of Communications and other departments will ensure that marginalised students in poor and remote areas will be afforded opportunities to access education (ibid).

“Distance Higher Education Programmes in a Digital Era: Good Practice Guide“, which was authored by CHE (2014), is premised on the notion that hybrid forms of distance education (online and offline) should foreground quality and accessibility of digital materials. The integration of ICT-supported educational methods into institutions of learning, plus the provision of online distance education can improve the accessibility and quality of education. This is made possible through increased interaction and better retention and success rates.

It can be claimed that South Africa is advocating for transformative educational measures, but it is still left wanting. By 2016, South Africa still had no clear policy on the implementation of ICTs in higher education, except for the DHET’s 2012 document that described the potential of ICTs to provide an inclusive educational environment (Ng’ambi et al., 2016). Despite transformative state policies and funding mechanisms, students still disagree with the social engineering initiatives that the DHET is implementing (Leibowitz & Bozalek, 2014).

South African HEIs are problematised against a backdrop of diverse socio-economic populations that require access to equitable quality education. The critical question

that this study addressed was whether ICT policy implementation was a key player in facilitating access, equity and quality in education.

2.1.4 Policies for access, equity and quality

The integration of Information and Communication Technology (ICT) in higher education is pivotal for enhancing access, equity, and quality. Globally, ICT has been recognized as a pivotal tool in expanding access to education. In the United States, for example, technology plays a significant role in advancing educational inclusivity, linking higher education to broader struggles for equality (Gray & Lewis, 2021) . Similarly, in Europe, digital platforms such as EduCTX have been developed to enhance accessibility and manage educational credits transparently (Turkanović et al., 2017). In Ghana, targeted policies supporting female students from underprivileged backgrounds have shown that technology is a crucial medium for ensuring inclusive education (Atuahene & Owusu-Ansah, 2013).

One of the notable case studies in Africa where ICT was used to increase access in education, is the partnership between Cubet Techno Labs and an African tech giant to create a digital ecosystem. This initiative aimed to provide African students with personalized education and resourceful study materials (Cubet, n.d.). The digital ecosystem developed by Cubet Techno Labs included an online platform that offered a wide range of educational resources, including interactive lessons, videos, and assessments. The platform was designed to be accessible on various devices, including smartphones, which are widely used in Africa.

A study on Kenya's ICT integration policy in education highlighted both successes and challenges. The policy aimed to bridge the digital divide and improve equitable access to quality education. However, the study found that while there were improvements, traditional inequities persisted, and political influences often affected policy implementation.

The digitalization of higher education in Ethiopia, guided by the Continental Education Strategy for Africa (2016-2025), has focused on improving ICT capacity to enhance access, quality, and management of education. This initiative aligns with the African

Union's vision and Agenda 2063, aiming to modernize education systems across the continent (Adamu, 2024).

Higher education institutions in South Africa have made strides in ICT integration. For example, the University of Johannesburg and the University of the Witwatersrand have been involved in projects that enhance e-readiness and incorporate ICT in their educational frameworks. These efforts have improved access to educational resources and facilitated better management of educational processes (Yu & Dlamini, 2024).

Kenya has made significant strides in integrating ICT into its education system, particularly through policies aimed at bridging the digital divide. This has led to improved access to educational resources and enhanced learning experiences. Despite these efforts, challenges such as inadequate infrastructure, limited internet access in rural areas, and political influences have hindered full implementation (Tondeur et al., 2015).

Ethiopia's digitalization efforts, guided by the Continental Education Strategy for Africa, have focused on improving ICT capacity to enhance access and quality in higher education. This has led to better management of educational processes and increased access to digital resources. The main challenges include limited financial resources, inadequate infrastructure, and the need for more government commitment to sustain these initiatives (Adamu, 2024).

South Africa has seen significant improvements in ICT integration, particularly in universities like the University of Johannesburg and the University of the Witwatersrand (Yu & Dlamini, 2024). These institutions have enhanced e-readiness and incorporated ICT into their educational frameworks, improving access and quality.

Similar to Kenya and Ethiopia, South Africa faces challenges such as digital infrastructure gaps, especially in rural areas, and the need for continuous investment in ICT resources. South Africa has relatively more robust policies and government support for ICT integration compared to Kenya and Ethiopia. This has resulted in more consistent progress in ICT implementation. South Africa generally has better digital infrastructure compared to Kenya and Ethiopia, although rural areas still face

significant challenges. South Africa has more financial resources allocated to higher education ICT initiatives compared to Kenya and Ethiopia, which often struggle with funding.

All three countries face common challenges such as inadequate infrastructure, limited internet access in rural areas, and the need for continuous investment in ICT resources. The primary goals of ICT integration in higher education across these countries are to improve access, equity, and quality of education. In all three countries, ICT has had a positive impact on enhancing educational resources, improving management processes, and providing better learning experiences. These comparisons highlight the shared challenges and successes in ICT implementation in higher education across these African countries, while also underscoring the unique contexts and resources that influence their progress.

In Africa, digital learning initiatives have demonstrated potential in promoting equitable access to education. Harle et al. (2021) emphasize the role of ICT in expanding higher education opportunities in Ghana, Kenya, and Nigeria. Similarly, South Africa's Extended Curriculum Programmes and the National Student Financial Aid Scheme (NSFAS) funding aim to promote equity, though their effectiveness is limited by financial constraints (Badat, 2010; Leibowitz & Bozalek, 2014). To bridge these gaps, greater investment in digital infrastructure and policy realignment with ICT-driven education is necessary.

By learning from global successes and failures, South Africa can develop and implement effective ICT policies that enhance access, equity, and quality in education. Takeaways for South Africa include investing in Infrastructure which includes improving internet connectivity and ensuring reliable electricity supply. The adoption in South Africa of comprehensive training programs to support teachers to effectively integrate ICT into their teaching practices is essential. South Africa must ensure that sustainable funding and support for ICT initiatives is available. The development of inclusive policies, leveraging partnerships nationally and internationally is paramount in the future of SA Higher education.

In South Africa, various studies have examined the implementation of ICT policies within higher education institutions, highlighting both advancements and ongoing

challenges. As far as epistemological access is concerned, in the US, academic pathways are used to support students to transition from secondary to post-secondary education by helping them to overcome hurdles or remove barriers to success (Bragg et al., 2006). In South Africa, such bridging programmes were run during the late nineties, with the aim of extending access to underprepared students (Troskie-de Bruin, 1999). While bridging programmes enhance epistemological access, the policies make no mention of the use of technology in facilitating them.
A recent review of 22 articles from 2020 to 2023 focused on disabilities, higher education, and digital learning in South Africa. The study identified significant gaps in institutional policies related to digital access, capacity development, and disability inclusion in teaching and curriculum design (Zongozzi & Ngubane, 2025). This underscores the need for comprehensive strategies to ensure equitable digital access for all students, particularly those with disabilities.

Research has delved into national and institutional pathways promoting ICT usage in South African higher education. These studies emphasize the importance of aligning institutional strategies with national policies to effectively integrate ICTs, thereby enhancing educational outcomes (Cross & Adam, 2007). However, challenges such as infrastructure limitations and varying levels of digital literacy among educators and students persist.

The 2004 e-Education White Paper aimed to transform learning and teaching through ICT. An evaluation of its impact revealed that while policy interventions were well-intentioned, the rapidly evolving digital landscape posed unique challenges to effective implementation (Mulaudzi, 2024). The COVID-19 pandemic further highlighted disparities in digital equity and access, suggesting a need for policy revisions to address contemporary educational challenges.

A critical review of ICT integration policies in South African higher education highlighted that while ICT implementation aims to improve education and promote equity, significant challenges remain (Kiarie & Jones, 2024). These include inadequate infrastructure, lack of training for educators, and socio-economic disparities among students, all of which hinder the effective realization of ICT's potential to promote equity.

Despite policy frameworks advocating for ICT integration, actual implementation has been slow. Factors such as insufficient infrastructure, limited digital literacy, and financial constraints have been identified as significant barriers. Addressing these challenges requires coordinated efforts from government bodies, educational institutions, and other stakeholders to ensure that ICT policies translate into tangible improvements in access, equity, and quality in higher education (Czerniewicz et al., 2006).

The literature indicates that while South Africa has made strides in formulating ICT policies to enhance higher education, effective implementation remains a challenge. Addressing infrastructural deficits, enhancing digital literacy, and ensuring inclusive policies are crucial steps toward achieving the goals of access, equity, and quality in higher education through ICT.

Higher education plays a crucial role in fostering social transformation and addressing historical inequalities. In many countries, affirmative action policies have been implemented to enhance access and redress historical discrimination, empowering disadvantaged groups through social transformation (McCowan, 2016). In South Africa, efforts to increase access, ensure equity, and improve quality in higher education have been reinforced through policy interventions, including the use of Information and Communication Technology (ICT) (Mzangwa, 2019; Leibowitz & Bozalek, 2014).

South Africa's post-apartheid higher education policies have prioritized massification and access to quality education through technological advancements (Department of Education, 1997). However, economic barriers continue to hinder full participation, particularly for students from disadvantaged backgrounds (Leibowitz & Bozalek, 2014). Despite increased Black student enrolment, disparities persist in technological access, which is critical for bridging the digital divide (Jaffer et al., 2007).

Equity in higher education involves addressing structural inequalities that disadvantage certain student groups. Studies indicate that in South Africa, race and class are the primary indicators of disadvantage, with Black students facing more systemic challenges than their White counterparts (Leibowitz & Bozalek, 2014).

Technology has the potential to mitigate these disparities by facilitating blended learning, remote education, and digital resource distribution (Jaffer et al., 2007).

Quality assurance in higher education is closely linked to the adoption of innovative teaching and learning methods. ICT integration enhances the quality of education by enabling interactive and collaborative learning environments. Cross and Adam (2007) highlight how ICT policies in South Africa lay the foundation for enriching curricula and expanding learning flexibility.

The 1995 National Qualifications Framework introduced outcome-based learning models, emphasizing skills development aligned with global economic demands (SAQA, 1995; Kraak, 2000). However, effective ICT implementation remains a challenge due to inadequate infrastructure and insufficient digital literacy among educators (Jaffer et al., 2007). Addressing these barriers requires comprehensive digital training for faculty and students, alongside robust institutional support for technological adoption.

ICT policy implementation in South African higher education is essential for promoting access, equity, and quality. While policies exist to support digital transformation, economic disparities, infrastructural challenges, and limited funding continue to hinder their full realization. Increased investment in ICT infrastructure, faculty training, and digital literacy programs is critical for leveraging technology to drive inclusive and high-quality education in South Africa.

South Africa can benefit from aligning its ICT policies with global trends. This includes adopting best practices in digital inclusion, cybersecurity, and data governance. Collaborations between the government and private sector can help bridge infrastructure gaps and drive innovation. Public-private partnerships can also support digital literacy initiatives. Investing in capacity building through education and training programs can enhance digital literacy and skills. This will enable more people to participate in the digital economy (Lesame, 2024). Harmonizing regulations with international standards can facilitate cross-border data flows and attract foreign investment. This can also help in addressing cybersecurity challenges. Ensuring that ICT policies are inclusive and address economic disparities is essential. This includes making digital technologies affordable and accessible to all segments of the

population. By addressing these challenges and aligning with global ICT policy trends, South Africa can strengthen its digital economy and ensure that the benefits of digital transformation are widely shared.

The White Paper of 1997 aims to democratise and redress past inequalities in the higher education system (Department of Education, 1997). It proposes growth in science, technology, engineering and mathematics (STEM) fields, in addition to a growth in research and community engagement skills. However, the policy paper does not mention the role of technology in the modernisation of the South African higher education landscape.

The National Plan for Higher Education (DHET, 2001) builds on the 1997 White Paper for Education and responds to the Council for Higher Education's (CHE) 2000 report. It addresses inequities, quality, efficiency and aims to increase participation rates in higher education (Ministry of Education, 2001). This plan aims to bridge the gaps in the White Paper policy of 1997 and the consequent disjuncture in the implementation of the policy. The plan was produced amidst existing challenges of inefficiencies, inequities, and a lack of transformation. It aimed to improve access and success rates for Black and female students, apart from increasing research outputs.

The CHE annual report 2000/2001 coincided with the launch of a new Higher Education Quality Committee (HEQC), a national plan for higher education and a new funding plan to support the latter. The report notes that at the time when enrolments had stabilised, the restricting of a co-ordinated higher education system was underway, and the number of private HEIs was increasing. In response to societal needs, the CHE introduced and incorporated curriculum restructuring and community engagement into academic programmes. This CHE report also reviews the issue of funding in supporting transformation, particularly the effectiveness of the National Student Financial Aid Scheme (NSFAS) in increasing access. Further, the report explains CHE's mandate, role, responsibilities and task teams. One of the main themes of this report is the CHE's progress and expansion plans for higher education in South Africa. In this period financial support was made available to historically disadvantaged institutions.

The Ministerial Statement on the Implementation of the University Capacity Development Programme (UCDP) 2021 – 2023 was introduced to provide resources

such as technology to close quality, equity and success gaps (DHET, 2020). At the time of this ministerial statement there were some challenges in terms of student success, staff development, curriculum transformation and lack of female and Black staff representation. In addition, the employment rates of NSFAS-funded graduates were not consistent across race and institutions. The UCDP aims to achieve the following: equitable access and success for all students; a transformed academic workforce; staff and curriculum development. The UCDP focuses on holistic student development, staff development and curriculum development imperatives like 4IR, decolonisation and climate change. A comprehensive monitoring and evaluation framework is in place to assess the UCDP and its impact.

The National Plan for Higher Education (DHET, 2001), however, makes it clear that adopting technological innovations without integrating them into traditional curricular transformation would be ineffective. Therefore, the focus should not be on increasing access to education only, but on using technology to facilitate increased success for disadvantaged learners.

The National Plan for Higher Education (DHET, 2001) and "the Report of the Ministerial Task Team (MTT) on the Implications of the 4th Industrial Revolution for the Post-School Education and Training System (PSET)" (DHET, 2020) both propose that access to higher education through equity in policy should remain high on the agenda, if the redress of apartheid-past inequalities and transformation were to be accomplished. Whilst the 4IR is transforming society, South Africa must harness the changes to produce a more inclusive society ibid). The Ministerial Task Team on the Implications of the 4th Industrial Revolution (4IR) for the Post-School Education and Training (PSET) System reports that the PSET must be reformed quickly in order to respond to 4IR-related challenges. Uneven distribution of educational resources in education is also addressed in "the National Development Plan 2030", which aims to redress poverty and inequality by 2023 (National Planning Commission, 2012).

The goal of the White Paper for Post-School Education and Training is to increase access, quality and access in post-school education, thereby contributing to social and economic development (Department of Higher Education and Training, 2013). The objectives of the policy paper are: social justice in a historically inequitable system; integration into a single co-ordinated system; expansion of access and diversity;

strengthening the link between education and the workplace; delivering education that is responsive to the societal needs and the economy. The policy addresses the needs of the disabled learner; expands open and distance learning supported by technology; simplifies the NQF. This policy mentions improved quality and expanded access to marginalised groups like the disabled through the provision of assistive devices. It also stipulates that Open Educational Resources (OERs) and open courseware should be provisioned through technology and other alternative delivery modes that can support the traditional and/or entirely online modes. The DHET aims to collaborate with Department of Communications and other departments to ensure education reaches remote learners at reduced costs (ibid).

Flexibility in offering The Policy for the Provision of Distance Education in South African Universities in the Context of an Integrated Post-school System offers flexibility in online distance or campus-based education, which helps to cater for students who cannot afford data (Department of Higher Education and Training, 2014). The policy places emphasis on the challenges and opportunities of distance education in providing for increased access, quality and equity. Its objective is to support distance education as an integral part of post-secondary education. Technological opportunities ought to be harnessed to support remote students with quality offerings, while simultaneously increasing access to all categories of non-traditional students. Technological developments promote OER implementation. flexibility to mature, professional and disabled students is made provision for through distance education.

In Distance Higher Education Programmes in a Digital Era: Good Practice Guide, the CHE (2014) mentions that poor-quality course design and lack of digital resources remain as major challenges, despite the growing popularity of online learning. The guide aims to help with the design, development and evaluation of distance education programmes through the integration of digital technologies. The document further emphasises the role of technology in integrating different modes of delivery. The guide also highlights the role of digital tools for assessment, in addition to principles such as collaborative models in joint delivery; systems thinking in managing distance education; and rigorous quality assurance reviews of distance education.

The Policy for the Post-School Education and Training Central Application Service captures the matriculation boards results to a central application service to streamline

the application process to PSET institutions (Department for Higher Education, 2017). It reduces the costs of applying to multiple institutions; provides career-guidance advice; and reduces administrative load on institutions. This policy serves to provide for a more streamlined application process for post-school education that benefits the wider education system (ibid).

The aforesaid are some of the major policies that are related to access, equity and quality in higher education. Technology was not mentioned until 2001 in the National Plan for Higher Education (DHET, 2001). Universities have responded differently to the integration of technology (Ng'ambi et al., 2016), however, they have all made use of the funding that was recently availed for cross-institutional implementation of technology.

2.1.5 HEIs' institutional policy responses to access, equity and quality

South African higher education institutions have implemented various policies to address the intertwined goals of access, equity, and quality. These efforts aim to redress historical inequalities and promote inclusive excellence within the higher education sector.

Post-apartheid, the South African government prioritised widening access to higher education (Department of Higher Education and Training, 2001). Policies such as the National Plan for Higher Education of 2001 set targets to increase overall enrolment and diversify the student body. Institutions responded by revising admission criteria and expanding outreach programmes to underrepresented communities. Despite these efforts, challenges persist, particularly concerning the preparedness of incoming students and the alignment of secondary education with university expectations.

The objective of equity initiatives is to ensure that all students, regardless of their socio-economic backgrounds, are accorded fair opportunities to succeed. South African higher education institutions have implemented support structures such as bridging programmes, academic development centres, and financial aid schemes. However, disparities still remain, especially in resource allocation and support services across different universities (Machingambi & Wadesango, 2012). The effectiveness

of these measures varies, highlighting the need for continuous assessment and targeted interventions.

Quality assurance mechanisms were established to maintain and enhance educational standards. The Council on Higher Education (CHE) oversees institutional audits and programme accreditations. Institutions have developed internal quality assurance units to monitor teaching, research, and community engagement activities. Balancing the expansion of access with the maintenance of quality remains a critical challenge, which necessitates innovative pedagogical approaches and curriculum reforms (Akoojee & Nkomo, 2007).

The interplay between access, equity, and quality requires integrated policy responses. Institutions are encouraged to adopt holistic strategies that can simultaneously address these dimensions. For example, the implementation of extended degree programmes aims to support underprepared students (access), provide additional academic support (equity), and uphold academic standards (quality) (Mbhalati, 2024). Continuous monitoring and evaluation are essential to ensure that these policies effectively contribute to the transformation of higher education in South Africa.

In conclusion, while significant strides have been made in formulating and implementing policies to promote access, equity, and quality in South African higher education, ongoing efforts are required to address persistent challenges and ensure that these policies translate into meaningful outcomes for all students.

2.2 Theoretical framework

The Hanson and Holmberg (2003) theory is a framework used in analysing policies and their implementation in European and Swedish higher education institutions. The socio-cultural approach to educational policy is aligned to the epistemological view of knowledge construction through social and cultural interaction. According to this policy the teachers' views of ICTs in education and the decisions they make regarding policy are influenced by their views of self (Vandeyar, 2013).

The first theory that was used to form the conceptual framework of this study, and describe what policies consist of, is Hanson and Holmberg's (2003) model, as illustrated in Figure 1 below.

Figure1: European ICT Policies for Educational systems

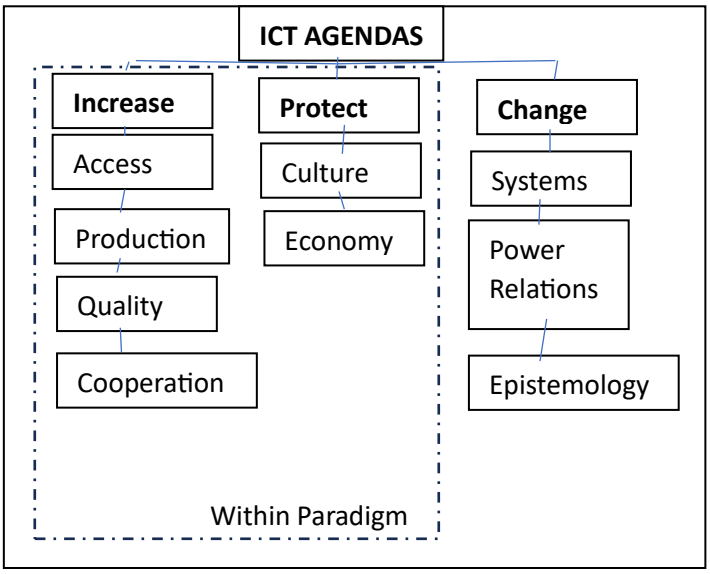


Figure1: European ICT policies for educational systems: categories for policy documents
(Source: Hanson & Holmberg, 2003 p. 4)

Figure 1 summarises the content of policy documents into three categories namely: increase, protect and change. Under these categories there are nine sub-categories. Increase relates to increased access to equitable education through technology. The achievement of the **increase** outcome would require cooperation from all stakeholders to ensure the availability of ICT infrastructure at technology level. Cooperation is also crucial at both macro (institutional) and micro (classroom) levels of policy implementation, while production consists of the measures that are taken to articulate national policies into institutional policies, as well as the implementation thereof. Production may also mean the increased production of digital materials, which may lead to quality education (Hansson & Holmberg, 2003). The **protect** component may relate to what is being done to preserve culture, norms and values through technology, as stated in the relevant policies (Cross & Adam, 2007). The quality of use of

technology for teaching and learning would cater for a diversity and equal participation opportunities in a digital economy. The DHET and institutions are responsible for achieving **change** by looking at how systems may be transformed to achieve the policy goals of the use of technology for the promotion of access, equity and quality. A paradigm shift will be desired from positions of authority in order to move towards a desired paradigm. A new epistemological approach that is in line with the new paradigm will then emerge.

Many policy goals are designed to increase different aspects of a system. These goals do not question the traditional educational system, but they fit into an existing paradigm. A few policies would question the traditional system, and the power relations between students and academics. A few policies may be instituted to guard and protect the historical culture and economy of a country.

Socio-cultural approach to educational policy

The first theory does not pay particular attention to the cultural meanings that people use to interpret their experiences and generate social behaviour, however, the second theory (the socio-cultural approach to educational policy) makes up for this deficiency. Sutton and Levinson's (2001) socio-cultural approach for educational policy studies, differentiates between 'policy as practice' and 'policy in practice'. Vandeyar (2013) draws out two guiding principles of a socio-cultural approach to education policies, 'policy as socio-cultural practice' and 'policy as agency'. Knowledge construction and experience are socially and culturally situated. The socio-cultural approach to policy studies seeks to further stakeholders' understanding of the social, cultural, and political dimensions of policy studies (Sutton & Levinson, 2001). In the socio-cultural approach attention is given to the meanings people make of their actions in particular social contexts. Policy formation occurs across many different contexts (Vandeyar, 2013). Policy can take on different forms, as it is enacted by the various social actors at different settings in the system.

Practice refers to how behaviour is enacted and constrained by certain structures, which however, allow an actor to exercise agency in a situation (Sutton & Levinson, 2001). Implementation shapes policy and directs attention to the meaning of policy in people's everyday lives. Policy is also negotiated daily and teachers' views of

themselves are influenced by their perceptions of the policy and the decisions that they make in relation to it (Vandeyar, 2013). The meaning that people appropriate to policy is the unit of analysis of that particular policy (ibid).

This study focussed on higher education players, the meanings that they make and the behaviour that they generate as they implement ICT policies in higher education. Individuals construct knowledge and locate their experiences in their immediate socio-cultural environment. The two theories that were discussed in this section complement each other in establishing the theoretical foundation of this study, given that both look at the cultural, contextual and political dimensions of the study. Together these two theories also form the conceptual framework of this study.

2.3 Conclusion

There is still great room for improvement in achieving access, equity and quality in higher education through the use of technology. The government needs to collaborate with all sector players to provide basic infrastructure to make ICT integration possible. Transformative pedagogies are needed to achieve paradigmatic change in the use of ICT for learning and teaching. The study sought to give policy implementers an opportunity to reflectively respond to the current needs and situations that are affected by ICT policy implementation. Transformation is possible through the implementation of ICT policy that promotes access, equity, and quality in education.

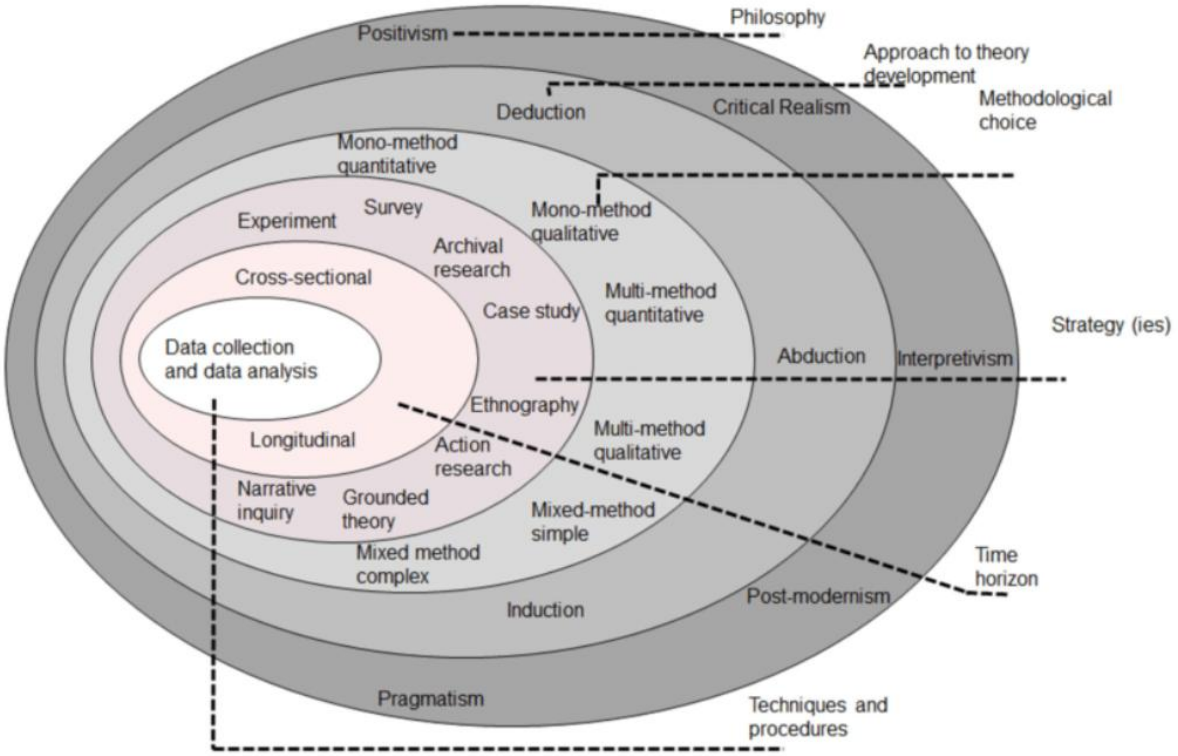
Chapter 3: Methodology

3.0 Introduction

Methodology delineates how research should be undertaken, which helps to ensure consistency between tools, techniques and philosophy in a thesis or dissertation (Melnikovas, 2018). The research onion in Figure 1 below describes layers of the research methodology that are to be accomplished in achieving a comprehensive methodology (M. N. K. Saunders et al., 2019a).

Figure 2

The research onion



Source: (M. N. K. Saunders et al., 2019a)

The research onion comprises six layers namely: philosophy, approach to theory development, methodological choice, strategy/strategies, time horizon, techniques and procedures

3.1 Research philosophy

A researcher's worldview about what constitutes real knowledge and how it is generated influences the research question and associated research design (Saunders & Tosey, 2012). Research philosophy falls into four distinct categories (ibid).

Firstly, the positivist research philosophy uses scientific methods of statistical testing of large amounts of quantitative data and then makes hypothesis testing (ibid). Secondly, a critical realist philosophy is ideally used when investigating both initial sensory experiences and related underlying complexities (ibid). Thirdly, an interpretivist paradigm is suitable when conducting subjective research of the social world and the meaning people give to it (ibid). Finally, pragmatism is ideal when the researcher intends to consider the practical consequences of the research findings (ibid).

This study adopted the interpretivist research philosophy. Interpretive research attempts to understand individuals' interpretations of the social phenomena that they interact with, instead of presenting a universal truth (Rehman & Alharthi, 2016). One interpretation is not preferred over another, but different socially constructed realities about the same issue are accepted (ibid). Rather than law-like generalisations, this study gathered rich insights from focus group interview participants (M. Saunders & Tosey, 2012).

3.2 Approach to theory development

A broader method of approach to a study can be either inductive, deductive or abductive (Saunders et al., 2019). Qualitative research is usually associated with inductive approaches to data presentation and analysis, while deductive approaches are associated with quantitative research techniques. Inductive approaches build theory from research, while deductive approaches start with an existing theory that would be tested throughout the research (Jansen, 2021). A third type of data processing, an abductive approach, is not restricted by any rule or type when interpreting collected data. A mental processing has to be undertaken to find a new type, thereby bringing together things which were never associated with one another (Flick et al., 2004). This study was based on textual data, so it is qualitative and, therefore, it adopted the inductive approach to theory development.

3.3 Methodological choice

A researcher can choose between quantitative method(s), qualitative method(s) or a combination of both (Saunders & Tosey, 2012). Research that is based on the

principles of positivism uses the quantitative research methodology for purposes of crafting the research design, and gathering and analysing numerical or statistical data(Adams et al., 2007). Qualitative research gathers textual, visual or audio-based data (Jansen, 2021) and employs non-quantitative methods of data collection and analysis to explore social relations and deep interpretations of interview data (Adams et al., 2007). This study analysed policy documents on the promotion of technology for access, equity and quality, then interpreted focus group interview data, therefore, a qualitative methodological choice was appropriate. This study is in the field of education. Qualitative research design flourishes in social science disciplines, which study the lived experiences of the participants.

3.4 Research strategy

This research adopted a case study strategy to study selected higher education institutions (HEI), in order to answer the research question and generalise the findings across several units (Gustafsson, 2017). In particular, multiple case study was adopted to investigate similar and contrasting results across and within institutions (Gustafsson, 2017). The study employed document review and analysis of policy documents. In this case, a multiple-case study strategy was used in the form of focus group interviews with participants from four different HEIs and the Department of Higher Education and Training (DHET), which was the fifth research site. Although the four HEIs may be regarded as homogenous, the fifth site adds heterogeneity to the sample base. In addition to the four learning institutions directors from DHET participated in this research. The four HEIs were purposively sampled for their rich exposure to policy-making processes and procedures. In addition, the evidence from a multiple-case study is stronger and more reliable than that which is derived from a single-case study (Heale & Twycross, 2018). The resulting theory of a multiple-case study is more convincing as it is grounded in several sources of empirical evidence (Gustafsson, 2017).

3.5 Time horizon

One can either collect data progressively over time or in a snapshot of time, i.e. longitudinal or cross-sectional time horizons (Jansen, 2021). In this study, the cross-sectional time horizon was deemed to be appropriate, as the data collection was limited to a short timeframe of approximately four months, in contrast to a longer

period, as required in the longitudinal time horizon. This study collected data on the implementation of ICT policy by academics and institutions in a specific short timeframe.

3.6 Techniques and procedures

At the core of the research onion are the practicalities of the sampling strategies and the data collection and analysis techniques and procedures that are used in a study (Jansen, 2021).

3.6.1 Data collection methods

Data collection is a crucial step in research, as it determines the accuracy and reliability of its findings. There are two main types of data collection methods namely: primary data collection and secondary data collection (Saunders et al., 2007).

3.6.1.1 Primary data collection

Gathering first-hand information directly from the original sources is called primary data collection. Researchers use this method to collect original data that are tailored to specific research objectives (Bryman, 2016). Primary data collection provides specific and up-to-date information (Saunders et al., 2019b). It allows researchers to design data collection to fit their study needs. It also ensures data accuracy as they are collected first-hand (Bryman, 2016). On the flip-side, primary data collection is time-consuming and costly, as it requires extensive planning and resources. It can also be affected by respondent bias or unwillingness to participate (Saunders et al., 2019b).

This research uses secondary data that has been collected by researchers who conducted an empirical research in India and South Africa (Misra & Ndlovu, 2022). Data was collected through focus groups and documents that were analysed to respond to the research question. Through separate Microsoft Teams meetings with respondents from each of the participating universities and the DHET, focus group meetings were held online. These focus group interviews were semi-structured and allowed for further in-depth probing of how policies were implemented to promote access, equity and quality in South African Higher Education.

Focus group discussions are a popular qualitative tool for gathering data from multiple participants simultaneously. It encourages interaction, synergy, and deeper insights into participants' beliefs, opinions, and experiences. The process of focus group discussions is to firstly define the purpose, then recruit participants, and establish rules (Akyıldız & Ahmed, 2021). One should ensure to use open-ended questions and adhere to respectful interaction. Recordkeeping and analysis of focus group discussion data was conducted systematically.

3.6.1.2 Secondary data collection

Secondary data collection involves using existing information that has been gathered by other researchers, organisations, or institutions (Johnston, 2014). Such data can come from academic journals and books, which comprise research studies, literature reviews, and reports. The other sources of secondary data are government reports and policy documents, which may comprise official statistics and policy guidelines. Institutional reports from universities, Non-governmental organisations (NGOs), and corporations also provide secondary data. Online databases and archives are publicly available datasets and historical records, respectively, and they are also used as sources of secondary data.

Secondary data collection is cost-effective and less time-consuming, since the data are already available (Johnston, 2017). It provides access to large-scale datasets that may be difficult to collect independently. It also allows researchers to analyse trends over time (Saunders et al., 2019). Inversely, secondary data may not be tailored to specific research objectives and this may compromise data accuracy and reliability, especially if the sources are not credible (Bryman, 2016). Furthermore, such data may be outdated or incomplete (Johnston, 2017).

In this study, which is titled "ICT Policies' Implementation to Promote Access, Equity, and Quality in Higher Education in South Africa", secondary data collection was used as the preferred method, for several reasons. To begin with, there is an availability of rich data sources like government reports related to DHET and studies by organisations such as the CHE. Research articles and institutional publications offer historical and comparative perspectives. Secondly, in this study data were gathered through focus group interviews (see the attached ethics certificate in Appendix A).

Gathering primary data through interviews or surveys would be time-consuming and it would require significant resources (Johnston, 2017), whereas secondary data are readily available, thereby making the sources more efficient and preferable options for policy analysis. The use of secondary data reduces the need for direct interaction with human subjects, therefore, it minimises ethical concerns related to informed consent and data privacy (Bryman, 2016).

3.6.2 Data analysis methods

For data analysis, this study employed thematic analysis (TA) or qualitative content analysis (QCA). The thematic analysis method is suitable for identifying, analysing and reporting patterns or themes in data (Braun & Clarke, 2006). In QCA data are categorised according to the classifications that are derived inductively, either through counting words or categories or without statistical techniques (Forman & Damschroder, 2007). Table 1 below shows a step-by-step guide for conducting thematic analysis.

Table 1

Phases of thematic analysis

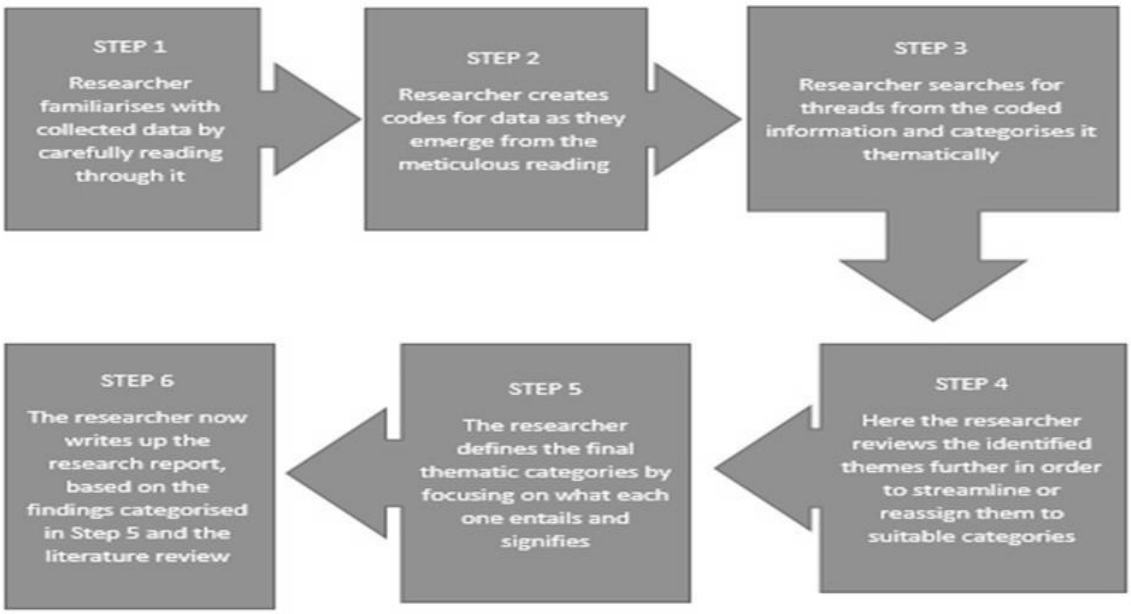
Phase	Description of the process
1. Familiarising yourself with your data:	Transcribing data (if necessary), reading and re-reading the data, and noting down initial ideas.
2. Generating initial codes:	Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code.
3. Searching for themes:	Collating codes into potential themes, gathering all data relevant to each potential theme.
4. Reviewing themes:	Checking if the themes work in relation to the coded extracts (Level 1) and the entire data set (Level 2), before generating a thematic 'map' of the analysis.

5. Defining and naming themes:	Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells, thus, generating clear definitions and names for each theme.
6. Producing the report:	The final opportunity for analysis. Selection of vivid, compelling extract examples, final analysis of selected extracts, relating back of the analysis to the research question and literature, producing a scholarly report of the analysis.

Source: (Braun & Clarke, 2006 p. 87)

Figure 3

Thematic analysis framework



Adapted from Braun and Clarkes (2006) and Maguire and Delahunt (2017)

The researcher carefully read through the collected data and identified initial codes, as per the interview schedule. Eight interview schedule codes were identified. In step 3 the researcher searched for threads from the data coded in ATLAS.ti. In step 4 the themes were reviewed to a total of 12 codes in ATLAS.ti. The final themes were then categorised, while the policy documents were analysed as per the three themes namely: 'access and policy documents', 'equity and policy documents', and 'quality and policy documents'. The final step in the six-step framework was the writing up of the research report.

3.6.3 Secondary data analysis (SDA)

This study used secondary data analysis, while upholding empirical research principles. When a systematic process is followed to analyse secondary data, beginning with developing a research question, identifying the dataset, and evaluating it, then secondary data analysis becomes an empirical exercise, just like the studies that utilise primary data (Johnston, 2014). Secondary data analysis (SDA) of the data that are collected during primary research to answer a new question, or use a different analysis strategy, has become commonplace (Szabo & Strang, 1997). Hinds et al. (1997) define the four approaches to SDA as follows:

1. The unit of analysis differs between the two studies

2. A more in-depth analysis of sub-themes with a subset of data
3. A more in-depth focus on important data of primary study
4. Newly collected data that, together with primary data, refines the research question.

Ruggiano and Perry (2019) critique SDA for lack of rigour and ethical considerations of the qualitative data. One debate regarding the rigour of SDA data relates to the socio-cultural-political time during which the primary data were collected, which may differ from that of the SDA time period (ibid). The ethical considerations of SDA relate to anonymity, confidentiality, and informed consent (Morrow et al., 2014). Ruggiano and Perry (2019) provide three recommendations to anchor SDA namely:
1. Increasing clarity and transparency in SDA
2. Consideration of ethics in conducting SDA
3. Increasing rigour in conducting SDA.
As a result, researchers should identify and describe the efforts that they make in a bid to promote rigour and ethics, thereby enabling the academic community to appraise such work and advance methodology (Ruggiano & Perry, 2019).

In the primary study the following steps, which are relevant to this study, were carried out:

- A document analysis of national and institutional policies related to the use of technology for promoting higher education (such as policies related to teaching and learning; technology use by lecturers and students; distribution of digital resources).
- Policy makers, such as those in the Ministry of Higher Education and Training, five HEI administrators from each institution (vice chancellors, deans, heads of education schools, ICT experts) were interviewed. This study limited itself to a data subset of four HEIs for SDA.
- Semi-structured interviews for academic staff to determine the extent to which existing ICT policies were implemented . In order to collect more in-depth data, focus groups were conducted.
- Data analysis and writing of portions of the research report – qualitative analysis techniques were used to analyse the data according to themes.

- The ethical approvals for both the primary and secondary studies were obtained prior to the data collection processes (see Appendix A).

3.6.4 Population and sampling techniques

Sampling is the process of choosing a representative group from a target population (McLeod, 2023). The unit of analysis in this study is 'the implementation of ICT policy in HEIs'. After having identified the unit of analysis, it is important to consider sampling. In qualitative studies, sampling is purposeful with the intent of understanding a phenomenon better, instead of making generalisations from study samples to populations (Forman & Damschroder, 2007). Non-probability sampling was employed in this study. When such a sampling technique is used, not every participant has an equal chance of being selected (McLeod, 2023). Convenience sampling is a type of non-probability sampling techniques, whereby participants are selected based on their accessibility to the researcher, rather than on the basis of representativity (Convenience Sampling (Accidental Sampling), 2023). Lecturers from the case study HEIs were chosen because the primary researcher could conveniently access them. Altogether 16 lecturers and 4 DHET officials took part in the study.

3.7 Ethical considerations

The first consideration regarding educational research is to avoid harming the participants, as they are exclusively human subjects. This was adhered to in the initial empirical research ethics clearance certificate whose protocol number is H22/09/20. The ethical consideration is also premised on the principles of privacy and confidentiality (Dooly et al., 2017). Since this research used secondary data, it was granted an ethics waiver clearance from the University of the Witwatersrand, where it is based. Throughout the research report, the names of the participants and the case study HEIs were anonymised and withheld, respectively.

3.8 Conclusion

This qualitative study employed qualitative methods for data collection and analysis. An interpretivist paradigm aligned to a qualitative study was also used. This chapter dealt with the research philosophy, population/sampling techniques, and data collection and analysis techniques. A document review of higher education policies was conducted. The data collected data for thematic analysis from the participating

HEIs were conducted through focus group interviews. The researcher cross-validated the two datasets through triangulation. The last section of this chapter described the ethical considerations that the researcher made, in the treatment of the research participants.

Chapter 4: Presentation and analysis of findings

4.0 Introduction

This chapter presented and analysed the data that were collected from the participants from the four HEIs and the DHET. All the selected research sites are based in South Africa. Firstly, the chapter analysed the policy documents that pertain to educational technology in the South African educational landscape. Thereafter, the chapter presented data that were collected from the focus group interviews.

This study sought to explore how the selected four HEIs were implementing the national ICT policy to promote access, equity and quality. The two theories that formed the theoretical framework of this study were Hanson and Holmberg's (2003) model and Sutton and Levinson's (2001) socio-cultural approach, which describe policy categories and analyse educational policy studies, in respective order. This study focussed on the meanings that players in higher education make and the behaviours that they generate when implementing ICT policies in higher education. A contexture of thematic content analysis was used to present and analyse the data in this chapter, against a backdrop of the two theories mentioned above.

4.1 Presentation and analysis of policy documents

The following sections present analyses of policy documents from the perceptions of the three dimensions of access, equity, and quality.

4.1.1 Access and policy documents

The White Paper 3 of 1997 and the National Plan for Higher Education of 2001, which both aim to provide guidance on increased access to higher education by addresses the access needs of the marginalised groups. Marginalised groups include students from financially excluded backgrounds, whose families cannot afford to purchase resources like laptops, which are essential for success in studies at higher education level. Through financial aid, students from economically disadvantaged backgrounds can access the resources that they need to achieve academic success. In her study, Lee Shong (2020) found that the "student laptop initiative" at one historically advantaged institution provided laptops to NSFAS-funded students who did not have these devices. The implementation of such an initiative exemplifies positive responsiveness to the policy imperatives. In a similar vein, students from historically

disadvantaged universities got first preference in receiving NSFAS-funded laptops during the COVID-19 pandemic (Eyaaz, 2021).

Even in this current age, students from marginalised groups lack rare digital technology skills, thus, hindering their academic success. During the apartheid era, Blacks and women were denied access to specific scarce skills programmes. One example of a policy in the skills development industry that speaks to the development and enablement of ICT skills is the National Advanced Manufacturing Technology Strategy (NACI, 2002), which advocates for fostering technological innovations through new knowledge networks that require collaboration amongst disciplines (ibid).

Epistemological access is arguably crucial for student success, yet most extant policies tend to address the former and omit the latter. For instance, the White Paper 3 of 1997 and the National Plan for Higher Education 2001, barely address the issue of academic success, if at all. The aforesaid national policies neither highlight throughput rates nor foreground student tracking for the purpose of monitoring success. To promote effective learning and student success, it is imperative to enable epistemological access and facilitate the ‘double-move’ in meaning making, which entails transitioning from the abstract to the concrete or from concepts to everyday knowledge (Lotz-Sisitka, 2010). It is worth mentioning that increasing the ability for equal participation in higher education or ‘epistemological access’ is a foundational imperative on which equity and quality issues are premised(Coughlan, 2006).

Later policies address success rates and the issue of students who are marginalised because they are academically underprepared to perform at higher education level. To address the gap between high school and higher education, access should be accentuated through bridging programmes. National policies address the plight of disabled students and propose to avail provisions to increase their access to higher education. “The National Plan for Higher Education” in South Africa of 2001 aims to increase the participation rate and broaden the student base to include disabled students (Ministry of Education, 2001). Reasonable adjustments to the teaching and assessment of disabled students is termed ‘curriculum access’ (Konur, 2006). Adjustments that can be made for learning disabled (LD) students include extended time adjustments during examinations. With the increased use of technology,

curriculum delivery has shifted to electronic forms from the traditional form and access to assessment the electronic curriculum has increased as an important access issue (ibid).

The report 'Implications of the 4th Industrial Revolution for the Post-School Education and Training System (PSET)' envisions a PSET system that is focussed on digital skills, flexible delivery models, lifelong learning and work-integrated learning (Department of Higher Education and Training, 2020). It intends to implement open learning programmes and develop an integrated ICT plan for the PSET system.

Technical and Vocational Education and Training (TVET) and community colleges are means of increasing access to higher education. As far as access is concerned, "the White Paper for Post-School Education and Training" aims to increase the number of TVET and community colleges and build two new universities (Department of Higher Education and Training, 2013). Students' articulation pathways into higher education from TVET colleges expanded access to post-school education, where some specific barriers had previously prevented them from meeting the entry requirements (Groener & Andrews, 2019). One of the key strategies that the White Paper for Post-School Education and Training, DHET (2013) proposes is to expand access to higher education by increasing the number of TVET colleges.

Open Educational Resources (OERs) are fundamental technology-based means of decreasing the access gap to higher education. "The Policy for the Provision of Distance Education in South African Universities" seeks to ensure that distance education becomes a viable option for expanding access to higher education in South Africa (Department of Higher Education and Training, 2014). The distance education option can harness the capabilities of ICT to improve the quality and reach of higher education. Promoting support centres for distance education, OERs and cross-border distance education are capable of ensuring the viability of distance education. OERs allow for improved quality in the reproduction of materials and initiation of a new business model around production and other OER services. The widening of access in higher education by extending access to non-traditional learners is one of the potential access-related benefits of OERs (Hodgkinson-Williams, 2010). OERs include a wide variety of digital resources that can be shared via the internet, when digitalised

(Berti, 2018). This shows the use of OERs in promoting technology for increased access.

The Distance Higher Education Programmes in a Digital Era: Good Practice Guide emphasises the need for tutorial support, provision of a variety of assessment methods to ensure good quality learning and teaching of distance education (Council on Higher Education, 2014). Among the specific recommendations for access that are stipulated in this guide are:

- recognition of prior learning to ensure flexible entry routes to programmes p.23
- student support in the form of academic advising, peer mentoring p.19
- inclusivity in addressing the needs of students from different levels of preparedness p.45.

Distance education and the digitalisation of learning and teaching can effectively increase access to higher education. The Policy for the Provision of Distance Education in South African Universities (DHET, 2014) and The Distance Higher Education Programmes in a Digital Era: Good Practice Guide (CHE, 2014) both support the use of technology to expand access to higher education through distance learning. The digitalisation of learning and teaching interactions has a positive impact on the traditional mode of delivery and distance education. Open universities offer opportunities for the expansion of higher education, as per the UN's sustainable development goals (Anderson & Rivera Vargas, 2020).

4.1.2 Equity and policy documents

The viability of government-initiated equitable funding models is a major concern in all institutions. The 1997 Education White Paper 3 and the National Plan for Higher Education of 2001 both address equity issues in higher education. Both policy documents analyse the success rates of undergraduates and participation rates in postgraduate programmes. Although the two policies broadly address equity, they do not pay sufficiently address the provision of funding and resources to disadvantaged institutions. Historically disadvantaged institutions rely more on government funding than on second and third-stream incomes to generate funds. Putting the responsibility on students and families to pay for tuition fees oversimplifies the issue, as cost-recovery mechanisms reproduce inequities for the disadvantaged (Ntshoe & De

Villiers, 2013). The policies do not highlight the social and cultural deficits that could be experienced by some students, if funding for their institutions is not foregrounded.

The CHE Annual Report 2000/2001espouses that student enrolment figures for Black students have increased, but not for all critical study fields and levels (CHE, 2000). In addition, the report notes that gender equity has not yet been attained in STEM fields (ibid). Human resource development, funding and institutional redress are a part of the equity measures that this report advocates. The report 'Implications of the 4th Industrial Revolution for the Post-School Education and Training System' outlines how the needs of society and the labour market should align to meet the needs of a knowledge economy (Department of Higher Education and Training, 2020). This report tables the following requirements for success: developing relevant curricula, facilitating new teaching and learning approaches, and building micro-credentialing systems. One of the top priorities of this report is to ensure ICT access and connectivity for all.

The innovative use of technology in credentialing qualifications is noteworthy. Micro-credentialing and digital badges are alternative ways of awarding credit for short term programmes that may revolutionise competency-based higher education learning more rapidly than traditional qualifications (Ahsan et al., 2023). The foregoing examples demonstrate the role of technology usage in increasing access to higher education. It is noteworthy that the report 'Implications of the 4th Industrial Revolution for the Post-School Education and Training System' (2020) makes mention of such examples.

The Policy for the Provision of Distance Education in South African Universities outlines the equity measures that are suitable for students who are unable to attend traditional universities due to affordability concerns (Department of Higher Education and Training, 2014). The policy also highlights the impact of technology integration for access and success in the provision of distance education. Further, the policy supports the promotion of OERs as means for improving the creation of materials and partnerships amongst institutions in providing distance education. Finally, the report indicates that student tracking systems can be used to address drop-out and failure rates, given their capability to promote technology usage in increasing access.

The Distance Higher Education Programmes in a Digital Era: Good Practice Guide emphasises the need for distance education to evolve with technology and remove barriers to education (Council on Higher Education, 2014). According to this policy document, HEIs should recognise flexible learning paths (different paces and multiple entry points) and prioritise community engagement efforts within their programmes (ibid).

4.1.3 Quality and policy documents

Although the 1997 Education White Paper 3 and National Plan for Higher Education in South Africa of 2001 mention the many efforts that were made to improve quality in higher education, they do not discuss quality standards in materials design, particularly that of OERs. Camilleri et al. (2014, p.19) suggest that when creating open educational content, the following three quality standards should be adhered to:

- the material should cover the body of knowledge
- the material should set out learning outcomes with associated assessment criteria
- the material should enable learners to meet the learning outcomes.

In a paper commissioned by the Commonwealth of Learning, one institution conducted a review and found that OER development could improve the production of learning and teaching material (Hodgkinson-Williams, 2010). The foregoing observation is also buttressed by the findings of this research study.

The National Plan for Higher Education in South Africa of 2001 underscores the importance of fostering appropriate graduate attributes and producing competitive outcomes that enable graduates to compete in the global knowledge economy (DHET, 2001). Merging skills and discipline specific knowledge opens up a future for disciplinary knowledge, for the benefit society and industry (Hill et al., 2016). ICT skills are critical in the promotion of graduates. Technological capabilities are aligned with curriculum outcomes, which advocate for fair, reliable and valid assessments and technology integration that facilitates collaboration, communication and access to resources. Strategies for maintaining online instructional quality are ensuring that learning and teaching strategies are varied to cater for all learning styles and that

assessments include a variety of assessments on a regular basis, coupled with timely and meaningful feedback (Gaytan & McEwen, 2007). Thus, ICT can be used to promote effective learning and assessment strategies.

The report "Implications of the 4th Industrial Revolution for the Post-School Education and Training System" calls for more flexible modes of learning, like online and blended learning. The report further emphasises the need for standardised quality assurance across PSET sectors. It highlights the importance of bridging the digital divide to harness opportunities of the 4IR, where students ought to be encouraged to immerse themselves in technology-enabled pedagogy, especially in STEM fields, thereby ultimately furthering the advancement of technology-based development (Naidoo & Singh-Pillay, 2020).

As posited earlier, most of the existing policy documents tend to focus on improving the quality of educational output, but they overlook the issue of observing quality standards in developing OERs. In other words, the policies largely address quality in using technology for learning and assessment, as well as quality assurance standards across PSET sectors.

4.2 Description of the case study institutions

The four HEIs are anonymised as HEI1, HEI2, HEI3 and HEI4. The fifth case study site is the Department of Higher Education and Training (DHET). HEI1 is a comprehensive university that was formed from the amalgamation of a historically White Afrikaans university, a Technikon and a historically Black university (Strydom, 2016). HEI2 is a product of a merger between a historically Indian university and a White English medium university (Seabi et al., 2014). HEI3 is a historically coloured university (ibid). HEI4 is a research-intensive, historically white, English medium university.

HEI1, which formerly excluded Black students, underwent a leapfrog change to become an innovative, excellent and quality higher education provider in South Africa, which is classified as a developing economy (Barnard & van der Merwe, 2014). HEI1 addressed the gap in access and success for the country's disadvantaged youth, especially in the light of the poor throughput rates of the secondary school system

(ibid). The university has become a global competitor in quality research and education, offering a plethora of academic programmes that range from short courses to postgraduate degrees (ibid).

HEI2 is renowned for its quest to become a 'Premier University in African Scholarship' (Chiweshe, 2010). This institution has made a name for itself as a leader in HIV/AIDS studies and food security (ibid). This HEI has a rich history of community engagement and community outreach centres (ibid). The institution boasts of colleges of nursing, humanities and agriculture, which are on par with the best in Africa.

Through visionary leadership, HEI3 was transformed from a historically disadvantaged institution into a leading research and teaching university (Althgafei, 2022). Amongst the critical success factors in the transformation of HEI3 are:

- a critical review of the role of management
- a change in vision and core values
- support from government
- financial resources
- academic improvement
- research and innovation
- community engagement.

An influx of talent in the post-apartheid era provided a resilient faculty base for the university (ibid).

HEI4 has flourished from a racialised institution to one that fosters inclusivity. This HEI is embedded in the cultural fabric of Africa, which shapes it through its teaching, research, and scientific endeavours, as well as the arts (ibid). The future of HEI4 lies in its vision of transforming culture and society, and deploying technological and digital transformation like machine learning, big data, artificial intelligence (ibid). As a leader in change, this university is harnessing its power of place by creating and applying knowledge, thereby setting it to become a leader in global higher education (ibid).

4.3 Presentation and analysis of focus group interviews

The process described below is a result of adopting the step-by-step guide of identifying, interpreting, and coming up with themes within the set of data (Merriam & Tisdell, 2015). The data from the focus group interviews data were transcribed using Microsoft Teams. The transcribed data were proofread in order to cater for the pronunciation of words in a South African accent, which is different from that of the MS Teams' U.S. English transcription. Initial ideas were assigned to the data in the light of the main research topic: 'ICT Policies' Implementation to promote access, equity, and quality in South African Higher Education'. All the pertinent points were organised into codes across the entire dataset.

From the transcription of the focus group interviews the following **codes** emerged:

1. Implementing access through policies for funding
2. Use of technology by higher education institutions to promote access, equity and quality
3. Challenges with using technology
4. Support and training needed to use technology

4.3.1 Implementing access through policies for funding

Funding seems to be the main vehicle for ensuring that students and lecturers can access technology and use it competently. For instance, the participants reported that they struggled during the COVID-19 period, in spite of the funding that the national government offered to mitigate the impact of the pandemic. Such funding initiatives included the UCDP and the COVID-19 responsiveness grant and they were meant to assist lecturers and students to transition to emergency remote teaching. DHETP1 confirmed:

> *'… the UCDP, which is that, grant as well as the COVID-19 responsiveness grant [for] universities, especially students and staff were actually able to utilise technology for equity purposes.'*

While the grants made possible the implementation of policies, DHETP1 viewed the funding as a means of promoting the use of technology for equity. In other words, the availability of financial resources in institutions ensured that there were programmes that gave students from diverse socio-economic backgrounds access to technology.

This speaks to the ‘increase’ construct in the main theoretical framework of the study (Hansson & Holmberg, 2003).

Grant funding is being made available for the development of 4IR skills among South African youth, thereby increasing access to higher education. In addition to the issue of making equal access to technology possible, in the excerpt below, DHETP2 mentioned that the DHET grant funding increases access to fourth industrial revolution technology skills, such as virtual reality, artificial intelligence (AI), big data, and related programmes:

> *‘It's one of the areas where we need to invest in, in-skilling…*
>
> *… So, making sure that we've got people who've got degrees related to things, for example like robotics, not even just degrees, qualifications, let me say in relation to things like robotics, artificial intelligence have a security.’*
>
> *UM, you know, data analytics have been mentioned, but even things like big data, you know, all of those types of fields.’*

These funded programmes are expected to go beyond technological skill development during tuition, but they should prepare students for their future occupations. Lack of connectivity is a critical issue in institutions that do not have adequate infrastructure. In the citation below, DHETP3 confirmed that, through DHET funding for the connectivity project, there was an improvement in infrastructure:

> *‘… rural campus connectivity project that we did together with the Department of Science and Innovation in bringing the connectivity to rural campuses.’*

This is evidence that collaboration between one or more ministries can assist in ensuring that the gaps in the provision of basic infrastructure are closed, thereby ensuring that the students in remote areas are exposed to technology.

DHET also funds projects for students with disabilities, which results in increased equity. Although there are no specific UCDP guidelines for projects for disabled learners, the DHET stipulates that all the HEIs should be inclusive in their planning. Although policy statements regarding inclusive education are not exclusively directed to HEIs, when universities apply for funding for projects relating to disabled students,

they should include such applications as a part of their main business plan, as evident in DHETP3's input below:

> *'The policy itself is not specific in terms of students with special needs.*
>
> *As I had mentioned, right from the beginning that it's all about students support then that student support is holistic student support.*
>
> *So, a university therefore in their business plan, if there is a need then they would put it in their business plan.'*

All the business plans that HEIs present to the DHET when applying for funding are expected to outline support programmes for both abled and disabled students. In addition, the DHET policy makes provision, through a special unit, for social inclusion that caters for the needs of students with disabilities by increasing equity for them. In the excerpt below, DHETP4 mentioned that the DHET grant funding (UCDP grant) caters for assistive devices for students with disabilities:

> *'… one of our units is called the Unit for Social Inclusion.*
>
> *And so, the policies that they have would mostly be looking at ways in which technology can be availed for students with disabilities.'*

The provision of grants, policy and resources to support and expand access to students with special needs is managed by the Unit for Social Inclusion. Moreover, there are some provisions that are made at institutional level to cater for students with disabilities. HEI4P4 delved more into the use of assistive technology devices to increase access to disabled students within HEI4:

> *'I'm talking about the accessible technologies, assistive technologies … We have a disability rights unit.*
>
> *And if there is somebody that needs some kind of assistance technology they are directed there only.'*

At HEI4, a Disability Rights Unit manages all governance issues that are related to the needs of disabled students. Furthermore, at institutional level instructional designers were required to implement accessibility design principles when designing inclusive education interventions. HEI4P4 reiterated:

'… digital accessibility for distance learning that has been implemented. So, a lot of it is on the [fore] front, even instructional designers and learning experience designers and all that don't really concern and don't end up originally don't really consider a lot of accessibility in the course design, but I know slowly but surely they are starting to implement.'

When designing online courses, it is critical to make considerations for digital accessibility. Learning experience designers at HEI4 were taking this into account when designing online and blended mode courses.

Cross-institutionally, a collaborative project between two universities was under discussion and its aim was to expand provisions for disabled learners by reviewing the universal design for learning (UDL). Ideally, UDL increases equity for disabled learners through incorporating good design principles to create bespoke content, as HEIP4 elaborated in the following extract:

'… we are doing with another HEI a project on incorporating UDL universal design for learning within the institution, so that will also change the mindset of the use of technology as a tool that aids equity and accessibility and stuff like that.'

At course design level, considerations regarding universal design for learning impact teaching and learning when lecturers are also capacitated in these design skills.

Finally, catering for disabled students through blended learning, applications for disabled students and taking their physical accessibility concerns into account during face-to-face classes, are some the key issues that warrant on-going discussion. HEI4P4 reiterated:

'I've also heard stories of where one lecturer just wants to do face to face, but then they had a disabled student, and it was loadshedding. So, the actual lifts didn't work. But the person[lecturer] the academic would not change the face to face and just add a Teams meeting to it. And, what the students had to do, they actually came together, and they lifted the disabled person and carried him up three flights of stairs and then put them so you [they] could or the student could actually join the class.

So, I know also on the ICT side they are getting requests from all different sides from faculties and schools for different types of technology or apps or Lt I [lti] and all that.'

Students, including those who live with disabilities, can empower each other through their own agency, and apply for technological support to increase equity, when and where it is needed.

Of prime importance is the policy framework that supports the implementation of funding projects. In this regard HEI4P1 stated that some policy documents that were meant to be implemented through funding projects for access, were outdated. The participant also mentioned the university standing orders left a gap in the policy framework, while white papers were more geared for schools than HEIs. On a positive note, the policy framework for open and distance learning (ODL) was said to be relevant to the South African context, as it gave students access to internationally recognized programmes. HEI4P1 summed all this as follows:

'So, there's a gap. There's definitely a gap.

Is the document that I think came out in 2004, which was like a White paper on ICT in education. And I think I agree with 'Participant's name' in that in the sense that it was more geared for schools really, although it was like a general document, and we basically use that.

Saying that insufficient standing orders and kind of that had to be.

So there's quite a few policies that have been put together. But like, when I started, I stated that a lot of it has focused on the DBE, the department of Basic Education

[There is] a draft policy framework for the provision of open learning and distance education in South African education and training.'

The relevance of the national policy documents to the current higher education climate, not just to Open and Distance Learning leaves many gaps. An exercise by the DHET to revise policies related to higher education may be in the pipeline.

In the spirit of ‘practice what you preach’ HEI1P2 explained that the focus was more on whether policies were in place and not on whether those policies were implemented. In the following extract, the participant (HEI1P2) succinctly described the gap between policy and practice:

> *‘We are not doing what's in our policies not doing per say, but we have to be realistic of the inequalities in our society. As said earlier on so, I think we tend to focus very much to say with this policy in place where this policy is in place, but are we really doing what's in those policies, especially now during COVID?’*

It was not until the higher education landscape was hit with the COVID-19 pandemic that it became clear that even the existing policy documents, however lacking, were not being implemented in totality, e.g. in a policy, provision may be made for the equitable access to technology-integrated education for all, but in reality was this really prioritized at institutional level before COVID-19?

The ‘how’ of policy implementation is the next focal point. Processes of policy development and implementation are surrounded by red tape. Multiple structures, including student bodies, must approve the implementation of policies at universities, while new policies must cater for new modes of delivery. In the extract below, HEI4P5 related the process of policy approval at HEI4:

> *‘Because like I when I started, I was told to get to the policy stage it has to go through all the faculties, all Deans, all the academics and the student council.*
>
> *So that although the process took into account access, because it brought in the student voice.’*

The process of policy formulation and approval may seem to be tedious due to all the stakeholders involved, but in the end, it would have more rigour because it incorporates input from all stakeholders.

Securing funding for teaching and learning projects through technology is not enough, so HEIs should also strive to provide resources that enable inclusive to access the internet and facilitate blended learning. At the peak of the COVID-19 period, South African HEIs made strides to provide all students with equitable access to learning

management systems (LMS). Providing students with free data was not sufficient, as mobile providers did not make it an entirely unlimited offer. In order to implement the policies for funding projects, HEIs had to ensure students had access to online learning technologies and this means that they had to have sufficient data to do so. HEI4P5 reiterated that access to physical devices and data to log on to the LMS were high priorities for HEIs:

> *'And so yeah, that's pretty much on and there's no real structuring according to ICT on the other than the new LMS and trying to get everybody capable or mastering the use of the digital platform.*
>
> *... So it becomes more costly and also the students with the data and all that had issues because of the fact that it wasn't enough where they actually had to ration and schedule when they're gonna use it or not. If they're gonna download it offline or.'*

Implementing a blended learning course successfully also depends on the students' ability to access the internet, which is also contingent on how much free data financially constrained students have at their disposal.

Lastly, the DHET monitors and evaluates how universities implement what they proposed in their plans, when applying for grant funding, as stated by DHET3 below:

> *'And mainly this ministerial statement is about providing guidance.*
>
> *Umm, they implement it as per the approved plans by the department.*
>
> *So it depends on what the university has proposed in their plan, in terms of what is it that they will be doing in terms of a utilisation of technology and mainly it's for teaching purposes and then what we monitor as the department is if they have actually done what was approved in the plan that they submitted.'*

Monitoring and evaluation is the final phases in project implementation and the DHET stipulates this as a part of their funding projects' project management phases.

4.3.2 Use of technology by HEIs to promote access, equity, and quality

Access to technology for teaching and learning was extended during emergency remote teaching. The DHET focus group highlights the role of COVID-19, emergency remote teaching and the establishment of an emergency grant to facilitate the

continued use of educational technology for educational and administrative purposes. According to DHETP4:

> *'… when we're struck by covet [COVID] quite a number of universities then had no choice but to go to remote teaching and learning.*
>
> *And in doing so, it was realised that and to be able or to succeed in doing this so that education doesn't stop, students need to be provided with gadgets or the devices that they would use to access technology and access teaching.*
>
> *The department had to develop a new grant an emergency grant and because there was this need now of continuing with teaching by students at home, so they had to purchase laptops or 8 pads [i-pads] for some of them, and so that teaching could continue even when they're at home.*
>
> *Yes, with teaching, they're able to continue with doing their assignments, writing tests and exams remotely.*
>
> *And then in terms of quality now of in education, in higher education, a lot of channels now are electronic.'*

The provision of technology during ERT helped students to continue with learning during the pandemic. In order to promote access to technology-enhanced education, adoption tactics for technology-based education had to be considered. HEI1P2 suggested that it should be mandatory for institutions to ensure the removal of all the barriers that hinder poorer students from accessing technology:

> *'I don't know if I should say compulsory because I'm not sure if lecturers would agree, but that would be the option that would force both students and lecturers to actually adopt the use of ICT.*
>
> *I think it can happen if we move some of the things online and we force them to actually go online and use the systems that they're supposed to use, then they are able to do that instead of waiting for another COVID or any other disaster to happen.'*

A blended approach, where a combination of online and face-to-face learning is maintained, may prove advantageous. Undeniably, forcing students to use technology

for learning would disadvantage those from poorer backgrounds, who lack resources. HEI1P2 surmised that:

> *'What do you do to undergraduate poor black students from township that have never seen anything digital.*
>
> *This is going to be a plus to a particular race, a particular class. So the university should actually look at it, issues of reality and feasibility.'*

As argued above, compulsory online learning may not be beneficial to digitally disenfranchised students from poorer backgrounds. However, digital learning is proving to be more engaging. HEI1P3 related that students seemed to favour online learning modes, as they have functions for recording of lectures. In some instances, lecturers can make use of social media to improve the quality of learning outcomes. HEI1P3 summed this as follows:

> *'OK. And this issue of advancing into digital technology has happened, so it has then increased the access for students because now they are aware that because even if you have a face to face class now, you'll find it that students now enjoy online more than what you are doing because when you are doing it online, you can even record and send it to them; the recording.*
>
> *After COVID-19 most academics were allowing students to use social media for teaching and learning where they were creating WhatsApp groups for teaching and learning. So I think teaching and learning is possible, yeah, with whatever kind of application that is useful for quality teaching and learning.'*

The use of technology for learning not only increases access, but it is also engaging, resulting in the achievement of quality learning outcomes. With regard to quality, it is imperative to mention the pedagogical value of a learning intervention. Recounting how LMS usage was contributing to the achievement of desirable pedagogical outcomes at HEI1, HEI1P4 reiterated:

> *'What we have established over the number of years and through various iterations are learning management systems.*
>
> *Umm. And so, the requirement is that students have to engage through the LMS.*

Umm. So, from that perspective it becomes integral to the learning and teaching process at the university. You can't teach, you can't learn without being on Blackboard. And similarly, the lecturers have to engage with their learners by offering lectures and so on.

And of course, we are also challenged with limited use by lecturers, teaching staff, particularly of using Blackboard for pedagogical support as a pedagogical device.'

As challenging as it is, an LMS is not a mere postbox, but it can also be used to create an engaging learning environment. Another crucial aspect of any pedagogical approach is assessment practice. The participants also alluded to their own and their institutions' e-assessment practices and policies. According to one of the participants, e-assessment platforms must have mechanisms for minimising cheating, thereby ensuring reliability and adherence to quality assessment practices, as HEI1P4 related below:

'I think the policy is very strong in terms of supporting and lecturers and students and then coming to the assessment. My experience as well in terms of my practices is that when students are writing, whether it's a test or an exam.

There's no chance of cheating at all. The questions get randomised.

Like, right, just because the assessment is happening online.

There's a lot of flexibility as well.

You can give them, let's say they are writing at a test.

Or maybe an open exam, maybe for five days, and then you say, oh, we're going to. It's gonna be open from this time to this time.

But when you open, there's a limited time if it's gonna be an hour, make sure that you do something within that hour.'

Online assessment practices can be reliable and valid if good assessment standards are followed.

4.3.3 Challenges with using technology

When technological devices are handed out to students who cannot access related support services, the gesture may prove to be futile.

At HEI4, the students who were loaned out devices such as laptops faced a number of challenges, particularly limited support from the ICT department. In the citation below, HEI4P3 lamented:

> *'But also the problem with giving people in more remote settings and students that are in more remote settings all the benefits of giving them devices and data was that I found from the students is if something went wrong with the laptop, if there was something wrong with the device, they could not come quickly to HEI4 to actually get it fixed.'*

There is a real need to come up with a digital strategy to support remote students. For example, universities can temporarily loan out laptops to students who would have brought their own devices to the ICT department for fixing. This strategy may help to minimise any attendant inconveniences that the students may experience while they wait to have their devices fixed.

Another challenge with using technology is that despite empirical evidence to prove that online assessments are reliable, it is still shrouded in a cloud of doubt. HEI3P1 mentioned some advantages and challenges with e-assessments. The reliability of online assessments may be subject to debate, as claims of group cheating in e-assessments have arisen. However, research shows that online assessments have substantial pedagogical value.

Some specific challenges and advantages of online assessments were identified at HEI3, as mentioned by HEI3P1 below:

> *'One of our biggest challenges, or the lecturers' experience, of course, is with assessment and yeah, the reliability of their results.*
>
> *But no need. I don't think we had significantly high marks which were not in line with a student's normal curve behaviour through the years.'*

It has been empirically proven that if the criteria for quality online assessments like fairness and transparency are adhered to, reliable results can be obtained. However, the process of deploying technology-mediated teaching and assessment present some challenges for lecturers, who are expected to expend extra time and effort to do so, thus, detracting from their personal life commitments. HEI4P1 lamented the negative impact of technology-driven practices on work-life balance:.

> *'We've all been through trauma, but the so I'm not. I'm not sitting here in judgment of people. We've all been through trauma, and we all just trying to also kick cope with our daily lives in this technological age. It's all just become so entangled, you know. And so at the end of the day, people are starting to protect their own well-being, which I'm not saying is a bad thing. I'm and I'm an advocate for, for, for welding [wellbeing], of yourself and others.*
>
> *That and a lot of people are saying, if I'm not OK, I can't be of any service to anyone else'*

However, it is evident in the literature that the initial effort that a lecturer puts into planning and designing a technology intervention for learning may be high, but the far-reaching result may be sweet.

4.3.4 Support and training needed to use technology

Various types of support may be required; therefore, it is imperative to identify the most suitable intervention that would be required to match the problem. HEI1P1 said that, firstly, a yardstick was needed to measure what type of support needed from the ICT support team, thus, lecturers must not take it for granted that the only help they would require is related to hardware. HEI1P1 summed up the above sentiments as follows:

> *'We assuming that they don't want to use ICT, but I don't think that there has been any research done to find out what support do they actually need with ICT's?*
>
> *Because fortunately, in some universities that the ICT team is mainly for technical issues like your computer is not is switching off, it's not for actually supporting lecturers who really are struggling with technology, but before that support can be given, surely a dip stick can be done.'*

There are multitudinous issues and problems that lecturers and students may report to the ICT support team. However, the ICT team is better able to assist if the support is contained to a specific area of technology support. Backup and emergency power supply is one type of support that would needed in times of loadshedding. HEI1 is looking at creative ways of addressing electrical and alternative power issues and allowing the government to play its fair role in addressing the electrical and alternative power issues. HEI1P2 says:

> *'Do we have power [electricity] enough to supply because it is going to be unfair?*
>
> *So that a particular group of students would have maybe the time where this power supply they would have gone through their courses, you come in the afternoon, the other group cannot. How do you balance that? So all those things that require a lot of visibility, a lot of lobbying in terms of even government to come to party in terms of being able to supply power so that all these things that we are, we are talking about can actually run in the university, can actually solve the problem.'*

The issue of collaborating with government departments to look at the problems associated with loadshedding and uninterrupted supply to educational institutions is under scrutiny. ICT support may also be availed to lecturers to enable them to free up their time by helping them to use technology for some of their pressing needs. Lecturers need to be supported, so that they may have ample time to support disabled learners, as related by HEI2P1 below:

> *'I want to speak again. I want to speak again in relation to those with disabilities, will always be the forgotten ones. There are complaints that the academics are not willing to include them. Lecturers do not have time. They need our support in terms of time so that they are. They can also have time for including those with disabilities.'*

As alluded to above, when lecturers are supported to use technology more efficiently, they would be able to spare time to support marginalised students, like the disabled, by designing better learning opportunities for them. Moreover, a helpful IT department acts as a one-stop shop for all the support needs of the lecturers, which range from

hardware and software to multimedia and blended learning support, as described by HEI3P4 in the following citation:

> *'Yeah, I was here ECT[ICT] centre.*
>
> *They embarked for the past, I don't know how many years now, where they give training to both staff and students. They are very approachable and they've got people allocated to specific faculties, to specific student groups for blended learning support. So the act of training of the center on the use of, of digital apparatus and equipment.'*

One of the functions of an ICT support department is to train lecturers and students to use digital devices and software. The IT department also offers different forms of assistance, such as telephonic, emails, walk-in, and call-out support in classrooms, where multimedia problems are common. Support is also required in setting up and monitoring hybrid web conferencing and simultaneous face-to-face classrooms. According to HEI3P5, the ICT department at HEI3 offers all these examples of support services. HEI3P5 reiterated:

> *'E-learning, writing e-mail to e-learning or even to service desks. it's always open.*
>
> *Yeah, it's always open and they can even go physically, even if they have problems with their laptops, they can walk in and then there is a policy that is there for students to get assistance 24/7.*
>
> *Challenges that those then go to the IT center, so the one is to do with the use of technology and the other is about developing skills and exposure to new software and the other one is then just the hardware and programmes*
>
> *… they also have the section where they assist lecturers during the blended learning. I mean hybrid you have students in the lab, I mean in the lecture hall and then others at home. So, you call them they have the numbers on the on the wall then they come quickly to assist.*
>
> *In terms of multimedia, yes.*
>
> *So, there's a lot and they have videos that if you need something any equipment even if you need a mic and so on.'*

Multiple ways are available for students and lecturers to log their support calls at all the case study institutions.

Sometimes the ICT Department may have funding available to assist with small scale projects to provide technological devices to a small group of students. The ICT Department at HEI3 provided a lecturer, HEI3P5, with funding to provide digital resources to students to create digital stories. HEI3P5 summed this up as follows:

> *'… I even got an opportunity where they were having some funding and the students needed, and they didn't have tablets to do their detail[digital] stories so that that also helped the students.*
>
> *As well, you know the contribution that was given, so they were possible they do help they are always there for the students.'*

Providing digital devices and supporting the use thereof for students and staff is a part of the ICT support function at HEI's. Another function of the ICT department at some universities is to recognise and showcase innovative use of technology by lecturers. Recognition and reward of innovative work done with ICT are great ways of incentivising good teaching practice. HEI3P4 related this experience succinctly:

> *'At ICT there's always colloquiums every year for people to showcase what they are doing.'*

The recognition of good teaching practice may not always be under the ICT banner, but it may be located in other departments like teaching and learning centres, depending on the teaching and learning structure of the university. However, LMS training for staff and students may be located in the ICT departments of the universities. HEI1 values LMS training**.** Low turnout for LMS training may be attributed to miscommunication. Changes in LMS versions may frustrate lecturers if they are not consulted beforehand. HEI1P1 opined that:

> *'The challenge they don't come to the training. when you see low turnout you think people are not interested in the training that is also speaks to the poor communication that is there the systems must speak to each other. There was no announcement of the training.*

So some of the things when you introduce changes for instance, what I can say about Blackboard now, it was changed, it was working. Now they introduced the patches that you can only see as about a few assessments on the list of the students. But that is not working for us. So, you know this kind of change that comes without the conversation, it's disastrous. So sometimes we might implement technology, but we need to be very much on the ground and engage those who use the technology.'

New versions and patches on an LMS must be communicated to the lecturing staff on the ground before time. Thus, planned LMS training needs to be communicated beforehand.

Universities also offer digital literacy training interventions to students and staff. For example, HEI3 was reported doing everything possible to get new students and staff digitally literate by offering training in ICT skills and orientation to university systems. According to HEI3P1:

'On opportunities to strengthen our students, ICT use, so by the time.

That's the pandemic hit us students were significantly exposed to the use of technology. So, on campus there are a number of computer rooms for students to access.

So to answer your question in short, yes, the university is actively engaging in getting our students ICT ready and to narrow the divide, at least in the context year of university where everyone has equal access to ICTs.'

Digital literacy programmes, especially for first year students, normally form part of the student orientation courses. The induction of new staff may also have a digital literacy component. It was also observed that lecturers' attendance of training increased during the pandemic. HEI2P1's contribution below highlighted how the emergence of COVID-19 pandemic increased the need to use ICTs for learning and teaching in HEI2.

For students to receive access to quality education, lecturers need to be trained to use technology effectively. For instance, during the pandemic, lecturers' attendance of LMS training improved.

'I think the attendance was very high in our school, especially because most of our academics were not used in the use of those technologies and they were willing to, and they were compelled to use it because of this COVID-19 that erupted previously. So, the attendance was very high, but previously the attendance was poor because there was nothing that was pushing them to use or compelling them to use those technologies.'

It seems a crisis can promote better access to quality education through technology, because during the COVID-19 era, lecturers were more willing to be capacitated with technology use skills. This gave them better exposure to opportunities to equip themselves with knowledge and skills to deliver quality education through technology during ERT.

4.4 Conclusion

This chapter provided an analysis of the policy documents related to educational technology, as well as an analysis of focus group interviews data that were gathered from DHET and four public universities.

In the first section, the policy documents related to ICT policy implementation in higher education in South Africa were analysed from the perspectives of access, equity and quality. The exclusion of marginalised groups from higher education on grounds of race, gender, socio-economic background or disability is one of the access concerns that are addressed through policy. The equity criteria that are considered through policy relate to gender and historical disadvantages emanating from the apartheid era. The selected policies interrogated quality assurance standards pertaining to OER development, graduate attributes, and instructional quality of blended learning .

The second section of the chapter discussed how grant-funded projects facilitate access to higher education through policy implementation. Examples of institutional policies related to teaching and learning were identified, while the need to design national policy collaboratively was confirmed. The use of technology during ERT was found to have contributed to increased access to higher education. The quality of teaching and learning can be increased when technology is used in a pedagogically sound way. The chapter also elaborated the pivotal role of the ICT department in the support and training of lecturers and students in ICT.

The findings in the two sections support and complement each other, which can be attributed to the value of triangulating data sources. The results of the study were discussed and summarised in chapter 5.

Chapter 5: Summary and discussion of the findings

5.0 Introduction

Overall, the findings from policy documents and the focus group interviews resonated with each other. The reviewed policies cater for the provision of IT resources to the financially excluded student populations, to whom access is also expanded through grant-funded projects. The policies alluded to the equity measures that were designed to support the needs of the knowledge economy, and this was echoed in the findings from the focus group interviews. The equity measures that were identified include grant-funded projects that make mention of policies to support the 4IR strategies of certain institutions. Both the policy documents and the participants of the focus group interviews identified the quality of online assessments and OERs as pertinent components in advancing the quality aspects of teaching and learning.

5.1 Overview of the key findings of the study

5.1.1 Findings from policy documents

Access-related policy documents revealed that there is a clear policy provision for financially excluded students to gain access to IT resources. This provision speaks to the increase access paradigm (Hansson & Holmberg, 2003). Furthermore, the exclusion of marginalised groups i.e. Blacks and women from rare technology skills development during the apartheid era was indicative of the socio-cultural policy and its political dimension of policy studies (Vandeyar, 2013). Although strides have been made to reform equitable access to higher education post-1994, much is left to be done to develop an infrastructure to support new policy implementation (Mabokela & Mlambo, 2017).

Another type of access that was brought to light through the review of policy was epistemological access. The shift needed to enact epistemological access for academically underserved students is an example of the change paradigm (Hansson & Holmberg, 2003). Quality and access are not exclusive topics, as access for participation and access for success are inherently part of academic development by which access can be achieved (Akoojee & Nkomo, 2007). Additionally, the provision of curriculum access to disabled students through the use of increased technology correlates with how an actor exercises agency as per the socio-cultural approach to policy studies (Sutton & Levinson, 2001). Access to higher education by means of the

establishment of TVET colleges also establishes articulation pathways into higher education, thereby increasing PSET access. Thus, ODL policies make provision for the digitalisation of teaching and learning to increase access through distance learning.

Equitable funding models for all types of institutions, whether previously advantaged or not, are being critiqued in policy implementation. Moreover, equity measures to address the challenges of a knowledge economy are proffered in national policy and reports (Department of Higher Education and Training, 2020). Micro-credentialing and student tracking systems are another means of using technology to increase access to higher education.

The implementation of quality measures to improve online learning using OERs is empirically supported, but it was not mentioned in any of the reviewed policies. Therefore, the government and higher education institutions should devise ways to integrate OER platforms into policy and institutional infrastructure, in order to provide a technical environment for OER development (Hodgkinson-Williams, 2010). The National Plan for Higher Education in South Africa (2001) also indicates that HEIs should be supported to produce quality graduates, who can compete in the global knowledge economy. Graduates are expected to be socially responsible citizens with a conscience to the developmental and societal needs of South Africa and Africa at large (Badat, 2005). Furthermore, the study found that the quality of online instruction and assessment were amongst the policy principles that were ascribed to in technology-integrated learning. Resultantly, one of the key findings from the reviewed policy documents was the emphasis on optimising hybrid modes of learning to harness 4IR skills.

5.1.2 Findings from focus group interviews

The findings were compacted into four broad themes, as listed below. The same themes were used to analyse and present the data from focus group interviews.

Theme 1

Implementing access through policies for funding

The use of technology for access through policy implementation is made possible by means of grant-funded projects. Additionally, grant funded programs include 4IR

technological skills development projects for employability. More critically, there is need to make provisions to utilise grant-funding to bring connectivity to remote areas that are plagued by lack of infrastructure. The DHET also caters for funding projects for disabled students and HEIs should include related action plans in their business plans. The DHET, however, makes provision for a Unit for Social Inclusion and an institution-based Disability Rights Unit. The latter is established to cater for the needs of differently abled students. Consequently, instructional designers are taking digital accessibility principles into account when designing online courses and content for inclusive education. A cross-institutional project is underway to look at UDL for content design.

Furthermore, the study found that the agency that disabled students were exercising for themselves in staking their claims to being accommodated, was becoming apparent. It was also found that policy frameworks to support funding projects for access may not necessarily cater for the current requirements of higher education and that although there were existing policies, the implementation thereof was found lacking. Thus, long-winded policy approval processes at institutional level were found to be tedious, but necessary. In addition, establishing online learning is not enough if students lack resources like smart devices and data, which are needed to access the internet and LMS platforms. Lastly, the reviewed policies alluded to the monitoring and evaluation of DHET-funded projects for improving access.

Although grant funding for projects to improve access to higher education through the use of technology was available, there seemed to be no provision to support policy implementation at institutional and national levels. Consequently, funding for future iterations of the project may not be automatically available and project continuity may suffer. The other challenge faced by HEIs and the DHET could be lack of systems to manage and disburse the grant funds efficiently.

Theme 2

Use of technology by HEIs to promote access, equity, and quality

The continuation of teaching and learning during the COVID-19 pandemic necessitated the provision of technology for online learning to students. Consequently,

the mandatory adoption of varying modes of hybrid learning led to the increased use of technology to promote access, equity, and quality. This extension of access, equity, and quality is founded upon Hanson and Holmberg's (2003) '**increase**' construct, which is also at the core the main theoretical framework of this study.

Furthermore, the study found that the quality of teaching and learning can be improved by establishing an engaging environment through employing technology and social media for learning. The quality of teaching and learning can also be improved through using LMS platforms to foster the best pedagogical outcomes. Additionally, the use of technology-enabled assessment methods that promote fair and valid online assessment practices was found to be capable of producing reliable results. Universities were also found to be playing instrumental roles in promoting pedagogically sound implementation of technology. However, it was established that at the end of the day, the lecturers had more agency to implement technology according to their capabilities.

Theme 3

Challenges with using technology

The provision of technology to students, especially those in remote locations who do not have access to reliable support services, may prove to be a daunting feat. Students in remote locations may take long periods to reach in-person support services, which are located on campus. Thus, such students may not be able to make productive use of the university-issued devices at their disposal. Despite the doubt that some stakeholders have in online assessment practices, this study found ample proof that they are largely trustworthy. Online formative assessments can align assessment with the learning and teaching goals, which can then inform the desired formative feedback (Gikandi et al., 2011). Moreover, the use of e-assessments can help academics to maintain a healthy work-life balance, a feat that can be challenging in this age of a ubiquitous technology culture. Stephen (2024) states that due to increased connectivity and constant availability, stress and burnout can lead to a reduced quality of life and well-being.

Theme 4

Support and training needed to use technology

There are numerous types of ICT support, therefore, it is essential for users to first determine the nature of the support that they need. This helps the ICT support team to provide effective services. Due to the continual power outages that South Africa is currently experiencing, continued energy supply becomes critical need that also requires a special type of support from the ICT team or related department. Supporting lecturers to use technology and manage their time more effectively, can free up time for them to support students who need additional attention, notably the disabled. ICT departments offer hardware, applications and networking support services, which HEI staff and students can request via various means. ICT departments also provide support in the form of digital resources for small-scale technology-integrated learning interventions and this service was found to be helpful in promoting learning and teaching. Moreover, the ICT departments may run projects to showcase good innovative practices of using technology for teaching and learning. ICT departments are expected to send communication pertaining to training and upgrades to LMS's. This is crucial to the successful deployment of ICTs for education. Furthermore, training may include digital literacy workshops for staff and students. It was also found that the emergence of the COVID-19 pandemic necessitated increased attendance of LMS and ICT training at HEIs.

5.2 Discussion

5.2.1 ICT Policies' implementation to promote access, equity, and quality

Both sources of data, i.e. policy documents and focus group interviews, showed that there were gaps in the implementation of ICT policy to promote access, equity, and quality. All the participants agreed that there was a need for a national policy to cater for technology that can advance access, equity, and quality. All the four case study institutions have institutional policies related to teaching and learning and they mention the importance of technology in promoting access, equity, and quality. However, the need for a national policy persists. Furthermore, the gaps in ICT policy can be attributed to the fact that national ICT policy does not specifically address the higher

education scenario, but it is directed at ODL and ODL institutions, therefore, it is outdated and irrelevant to the current HE climate.

According to the findings of this study, the needs for technology access by students were being addressed by grant-funded projects, such as the UCDP grant. Based on the main theoretical foundation of this study, the examples of expanded access, equity, and quality are premised on the 'increase' construct of Hanson and Holmberg's (2003) theory. From the point of view of Sutton and Levinson's (2001), the socio-cultural approach to policy studies seeks to further stakeholders' understanding of the social, cultural, and political dimensions of policy studies. This view is also supported by Vandeyar (2013). Thus, the provision of access to technology for marginalised groups, like disabled students, stems from the socio-cultural approach.

Notwithstanding the abovementioned gaps in the study, the study established that HEIs had made strides in implementing policy and technology. Online and blended learning, OERs, micro-credentialing, student tracking systems and digital technologies for ERT were all introduced to further the ends of increased access, quality, and equity. Thus, the use of the LMS for pedagogical purposes was furthered. The paradigm shift needed to implement the 'Change' construct of the Hanson and Holmberg (2003) framework during the implementation of bridging programmes for epistemological access was evident in the findings of the study. However, the process of policy formulation should involve all stakeholders, and they should all participate equally and collaboratively in the policy debate. The findings from the study highlight several gaps and needs in the implementation of ICT policies to promote access, equity, and quality in higher education. These insights can be linked to specific ICT policy recommendations in South Africa as follows:

Need for a National Policy: The study emphasizes the necessity for a comprehensive national ICT policy that specifically addresses higher education, rather than focusing solely on Open Distance Learning (ODL) institutions. This aligns with the recommendation to update and expand the scope of the 2016 National Integrated ICT Policy White Paper to include higher education institutions (HEIs) and their unique needs.

Addressing Infrastructure Gaps: The gaps in ICT infrastructure, particularly in rural and underserved areas, are a significant barrier to access and equity. South Africa's policy

should prioritize the expansion of broadband connectivity through initiatives like the South Africa Connect project, which aims to provide broadband services to government facilities and can be extended to educational institutions.

Grant-Funded Projects: The study notes that grant-funded projects, such as the University Capacity Development Programme (UCDP), are addressing some of the technology access needs of students. This suggests that continued and increased funding for such projects is essential. Policies should support and expand these grant programs to ensure sustained access to technology for all students.

Socio-Cultural Approach: The socio-cultural approach to policy studies, which emphasizes understanding the social, cultural, and political dimensions of policy, is crucial for addressing the needs of marginalized groups. South African ICT policies should incorporate this approach to ensure that technology access initiatives are inclusive and equitable, particularly for disabled students and other marginalized groups.

Stakeholder Involvement: The study highlights the importance of involving all stakeholders in the policy formulation process. This is critical for ensuring that policies are relevant and effectively address the needs of all parties involved. South African ICT policy development should be a collaborative process that includes input from educators, students, policymakers, and industry experts.

Promoting Online and Blended Learning: The strides made by HEIs in implementing online and blended learning, Open Educational Resources (OERs), micro-credentialing, and digital technologies for Emergency Remote Teaching (ERT) should be supported by national policies. These policies should encourage the adoption of Learning Management Systems (LMS) and other digital tools to enhance pedagogical practices and improve access, quality, and equity in education.

By addressing these recommendations, South Africa can strengthen its ICT policies to better promote access, equity, and quality in higher education, ensuring that all students benefit from the digital transformation.

The following is a representation in tabular format of the key findings from the two datasets investigated.

Table 2

Summary of key findings from two datasets

	Findings from policy documents	**Findings from group interviews**
Theme 1 – Implementing access through policies for funding	• Financially excluded students gain access to higher education through funding projects.	• Grant-funded projects and 4IR employability projects employ technology to increase access. • Projects catering for connectivity in remote areas are also made possible through grant funding. • Projects for improving access to disabled students in the form of funding, funding of disability rights units, implementation of UDL by instructional designers are all examples measures to improve access to disabled students. • Access to the internet and mobile data for students are necessary to promote online learning. • Monitoring and evaluation processes by the DHET are critical to ensure the success of DHET funding provisions.
Theme 2 – Use of technology by HEIs to promote access, equity, and quality	• Marginalised groups gain access to rare technology skills. • Epistemological access to underserved students is a type of access that promotes equity in learning and teaching. • Access for success is a measure to achieve quality educational outcomes. • Increased access to disabled students is facilitated through the use of technology. • Articulation to higher education increases access to PSET.	• Mandatory adoption of varying modes of hybrid learning led to increased access, equity, and quality in learning and teaching. • Quality in teaching and learning is improved by providing engaging online learning environment, deploying technology, social media and the LMS for best pedagogical outcome. • Fair, valid, and reliable online assessment practices are possible when using technology-enabled assessment.

	• Access is increased through ODL and digitalisation of distance learning. • Micro-credentialing and student tracking are examples of technology used to increase access to higher education. • A technical environment for OER development will lead to quality improvements in online learning using OERs.	
Theme 3 – Challenges with using technology	• Quality of online assessments may present a challenge is not implemented according to sound assessment principles.	• Handing out technology to students in remote areas that do not have support structures may prove to be a daunting task. • Online formative assessments and their formative and summative value can be proven empirically. • A work-life balance in a technology-driven age may prove to be challenging.
Theme 4 – Support and training needed to use technology	• Online instructional and assessment quality needs training and support structures to be in place.	• Establishing the type of ICT support needed may prove effective in addressing the problem. • Power supply during loadshedding is a critical and needful support system. • Supporting lecturers in managing their time in using technology better may help free up time for lecturers. • Support of all types of IT services via all forms of support requests will ensure the viability of the IT department. • ICT department has to provide digital resources for small- and large-scale projects to promote teaching and learning.

		• Recognition by means of showcasing innovative practices using technology for teaching and learning may be in the ambit of the IT department. • Good promotion and communication methods of LMS training and upgrades will ensure the efficient provisioning of the LMS and educational technology.

5.3 Conclusion

In this chapter, the theoretical frameworks upon which the study is based were discussed in the light of the findings. The study identified some gaps in policy and the means for address them were reported in the data. The following chapter, which concluded the study, provided suggestions and recommendations for the implementation of policy for access, equity, and quality in South African higher education.

Chapter 6: Conclusions and recommendations

6.0 Introduction

This final chapter presented evidence-based conclusions and recommendations, as well as the limitations of the study. Additionally, the suggestions for future research were outlined. Although the study found congruence between the findings from policy documents and the focus group interviews, the actual institutional policy documents and the implementation strategies warrant further investigation.

6.1 Limitations of the study and suggestions for future studies

A qualitative methodology was used in the study. The data were, therefore, self-reported and prone to bias (Rosenman et al., 2011). Thus, the results of the study are not generalisable to all institutions in South Africa, neither to all staff within a specific case study institution. Although this limitation is countermanded by triangulation of data between the policy reviews and the focus group interviews, an opportunity still exists to explore how institutions operationalise key policies that are related to the main mandate of the HEIs namely: teaching and learning, assessment, and research. Thus, future studies may also explore how institutional policies are implemented to promote access, equity, and quality in South African HEIs.

6.2 Conclusion

The aim of this study was to establish how ICT policies are implemented in advancing access, equity, and quality in South African HEIs. Firstly, it was found that the inclusion of financially excluded groups was entrenched in policy and supported by grant-funded projects that were dedicated to increasing access. Further, equity was increased to previously disadvantaged groups through policy and projects that were meant to increase scarce technological skills. Moreover, the quality of teaching, learning, and assessment interventions was increased through policy, and this was further corroborated by focus group interview findings.

The two theoretical frameworks of the study provided a backdrop to undergird the understanding of the researcher in making sense of the concepts that were uncovered in the research. Hanson and Holmberg's (2003) framework for analysing policies and Sutton and Levinson's (2001) socio-cultural approach for educational policy are complementary in assessing the role played by South African ICT related policies in the transformation of higher education institutions. While Hanson and Holmberg

(2003) summarise the content of policy documents into three categories namely: 'increase', 'protect' and 'change', the socio-cultural approach to policy studies seeks to further stakeholders' understanding of the social, cultural, and political dimensions of policy studies (Sutton & Levinson, 2001). The socio-cultural approach was used to highlight the meanings people make of their actions in a particular socio-cultural context while Hanson and Holmberg's (2003) views were applied in analysing policy goals. In the next paragraph, a summary of the findings was made in the light of the main research question: 'How does ICT policies' implementation promote access, equity, and quality in higher education institutions (HEI) in South Africa?' and sub question 1: 'What are the best practices to promote access, equity and quality amongst HEIs in SA?'

Although the inclusion of financially excluded students is catered for in policy documents, the best practice to promote access is to apply for grant funding for such students through the DHET funding. Furthermore, the projects for developing rare technological skills can address equity concerns about the political exclusion of Blacks and women from the development of such technological skills. The issue of quality was addressed in policy documents, as well as focus group interviews, where online assessments and graduate attributes related quality outcomes were discussed. The best practices in using technologies for access, equity, and quality include: the use of OERs, micro-credentialing, and student tracking systems. Another practice for increasing access is the implementation of funded projects to cater for disabled students. The study also found that good online assessment design could lead to valid, fair, and reliable online assessments. Finally, the findings from the two datasets established that all forms of support and training for students and lecturers in all ICT disciplines should be effective and efficient.

6.3 Recommendations

Most of the recommendations that were made in this study came from the focus group interviews with the lecturers and DHET staff. The recommendations were summarised as follows:

- There is a need for the increased implementation of OERs in learning and teaching practices to improve access and quality. Evidence shows that OER practices expand access and improve quality of learning and teaching outcomes (Hodgkinson-Williams, 2010). Policy governing OER usage needs to be kept up-to-date.
- A comprehensive business plan should be developed when applying for grant funding that includes the needs of disabled students, also catering for them at institutional level. The UCDP fund requires applications to be integrated to cater for a cross spectrum of students and making mention of marginalised student groups, if need be.
- Collaboration at ministerial level can ensure that infrastructural shortcomings are addressed. When two or more government departments collaborate in addressing the infrastructural needs of the country, far-reaching outcomes may be achieved.
- Cross-institutional projects can help in advocacy for disabled students and their curriculum design considerations. Universities have the same marginalised student population groups, and applying for funding for inter-institutional projects to address the needs of such groups may prove to be effective in addressing their learning needs.
- The DHET can benefit from a revision exercise of ICT policies for promoting access, equity, and quality. National policy that caters for the promotion of technology to address access, equity, and quality.
- The inclusion of all stakeholders in policy design and implementation may result in rigorous policy frameworks. All universities, in collaboration with the DHET, need to be involved in the design of such policy.
- Regularly updated institutional policies are essential for effective daily governance of a university. Institutional policies may incorporate national policy statements that are relevant to the processes of the university, and to the promotion of technology for access, equity, and quality at national level.
- LMS's and instructional technology may be used to produce the best pedagogical outcomes of learning and teaching. Student engagement in the learning process is possible, if good learning design principles are followed in

using technology. Teaching and Learning policies need to reflect the sound pedagogical use of LMS's.

- Online assessments are reliable if good online assessment practices are followed. Formative online assessments can promote self-regulated learning, whereby feedback on the ongoing monitoring and assessment is shared between learners and facilitators (Gikandi et al., 2011). Assessment policies need to be kept current.
- ICT departments should provide multiple types of support channels for logging request-for-support calls. Responsive and well-managed ICT support departments can attend to ICT related requests and problems efficiently.
- Training schedules for ICT technologies and upgrades to ICT systems should be well-communicated to lecturers before time. Advertisement of ICT training and a process to govern enhancements and upgrades of instructional technology like the LMS should be in place.
- A project-based approach to implementing grant funding may work better as institutions are at varying levels of provisioning. The DHET uses a project-based approach to manage grant funding applications and it works effectively for each institution's process to be managed on an individual basis.
- Alternative energy and communications devices should always be on standby, especially in this age, where power failures are a reality. The demand for constant connectivity and uptime requires continued power supply as a necessity. This may be taken up at institutional level and at governmental level.
- Although ubiquitous mobile devices are regarded as disruptive technologies in a classroom setting, they can be advantageously incorporated into learning and teaching. M-learning is based on connectivism that states that learning can reside in non-human devices (Herrington & Herrington, 2007). The affordances of mobile technologies accompanied by appropriate theoretical frameworks will ensure that mobile technologies can be used for best learning outcomes.
- Technology systems are to be seamlessly integrated so that all systems can speak to the institutional LMS.
- The digital agency of lecturers and students is critical. Lecturers who are competent at using technology in their practices to solve current problems and improve the quality of education display digital agency (Aagaard & Lund, 2019).

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8.0 Appendices

Appendix A: Ethical Clearance Certificate of Primary study

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Research Office

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

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER: H22/09/20**
PROJECT TITLE	Technology to Promote Equity, Access, and Quality in Higher Education: Policies and Practices in South Africa and India
INVESTIGATOR(S)	Dr N Ndlovu
SCHOOL/DEPARTMENT	Wits School of Education/
DATE CONSIDERED	16 September 2022
DECISION OF THE COMMITTEE	Approved Risk Level: Minimal
EXPIRY DATE	16 October 2025

DATE 04 November 2022 **CHAIRPERSON** _____
(Professor J Watermeyer)

cc: Supervisor : N/A

DECLARATION OF INVESTIGATOR(S)

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

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

_____ 04/11/2022
Signature **Date**

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES