



Access, awareness and use of ICT to promote efficient teaching and learning in the classroom for grade 11 learners at Finetown Secondary School in Johannesburg

By

Sindiswa Khumalo

(216008452)

Submitted in partial fulfilment of the requirements for the degree of Masters of Information Studies. School of Social Science, College of Humanities, University of KwaZulu-Natal, Pietermaritzburg.

Supervisor: Dr Siyanda Kheswa

Declaration

I Sindiswa Khumalo declare that:

- (i) The work presented in this dissertation is my own work
- (ii) This dissertation has not been submitted for the awarding of a degree or for examination at any other institution of higher learning.
- (iii) All data, graphs and any other information obtained from external sources have been acknowledged duly.
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Sindiswa Khumalo

Signature: [REDACTED]

Date: ...13/07/2025.....

Dr. S.E. Kheswa

Signature: [REDACTED]

Date: ...13/07/2025.....

Dedication

This study is dedicated to my uncle Elisha and my late aunt Zethu, who never stopped believing in me. To my kids, may this study motivate you to chase your dreams.

Acknowledgements

First and foremost, I would like to express my deepest gratitude to God Almighty, whose grace, strength, and wisdom carried me through the most challenging moments of this academic journey. When I felt overwhelmed and doubtful, it was through divine guidance that I found the courage to persevere and the clarity to complete this research. I am profoundly thankful to Dr Siyanda Kheswa, my supervisor, for his invaluable academic guidance and encouragement throughout the course of this study. To my family and my kids, thank you for your unwavering love and patience during the long hours of study and writing. Your emotional and moral support has been the silent strength behind this achievement. I am truly blessed to be surrounded by such support, love and resilience.

Abstract

The integration of Information and Communication Technology (ICT) is crucial for modern education, yet its potential remains largely untapped in many schools in South Africa. This study investigates access, awareness and the actual use of ICT to promote effective teaching and learning at Finetown Secondary School in Johannesburg. The study utilised a mixed-methods approach involving surveys of grade 11 learners and interviews with teachers and revealed a significant contradiction that while 72.7% of learners have access to ICT devices at home, only 10.2% have access at school. As a result, the vast majority (88.6%) report never using ICT for educational purposes in the classroom. The findings of the study identify key barriers that include a critical shortage of devices, poor internet connectivity and a profound lack of formal ICT training for both learners and teachers. Despite these challenges, learners recognize the importance of digital skills for their future careers. The study concludes that the digital divide is not merely a matter of hardware but of integration and capability. It recommends strategic investments in ICT infrastructure, reliable internet and comprehensive, pedagogically-focused training programs. The study is of the view that addressing these issues is essential to bridge the digital divide and equip learners with the competencies necessary for the 21st century.

Keywords: Access and Awareness, Digital Skills, ICT, Teaching and Learning,

Table of Contents

Declaration.....	ii
Dedication.....	iii
Acknowledgements.....	iv
Abstract.....	v
List of Abbreviations and Acronyms.....	x
.14List of Figures.....	xii
List of Tables	xiii
Chapter One.....	14
1. Background and Introduction	14
1.2 Problem Statement	18
1.3 Rationale of the Study	19
1.4 Purpose of the study	20
1.5 Research objectives	21
1.6. Key Research Questions.....	21
1.7 Significance of the Study	22
1.8 Theoretical Framework.....	23
1.9 Delimitations of the Study	26
1.10 Research Methodology.....	26
1.11 Ethical Considerations	27
1.12 Definition of Terms	27
1.13 Structure of the Dissertation.....	28
1.14 Summary of the Chapter	29
Chapter Two	30
Literature Review	30
2.1 Introduction.....	30
2.2 ICT as a Concept.....	30
2.3 South African Education System and the Rise of ICT in Education.....	31
2.4 ICT Integration in South Africa	36
2.5 Access to ICT Infrastructure and Resources in South African Schools	42
2.6 Awareness of ICT among Teachers and Learners	44
2.7 Digital Divide	46

2.8 Legislative Framework Guiding ICT Usage In Education	50
2.8.1 National Education Policy Act (27/1996)	50
2.8.2 White paper 7 on e-education (2004)	51
2.8.3 National Integrated ICT Policy Green Paper	51
2.8.4 South African Schools Act (SASA) (1996)	52
2.8.5 National Development Plan (NDP) Vision 2030	53
2.8 Theoretical Framework.....	54
2.10 Summary of the Chapter	57
Chapter Three	58
Research Methodology	58
3.1 Introduction	58
3.2 Research Paradigm	58
3.3 Research Approach	60
3.4 Research Design	61
3.5 Population and Sampling	61
3.5.1 Sample Size	63
3.6 Data Collection Instruments	63
3.6.1 Questionnaire.....	63
3.6.2 Observation	64
3.6.3 Interviews	65
3.7 Reliability and Validity	65
3.7.1 Data Analysis	66
3.8 Summary of the Chapter	67
Chapter Four.....	68
Data Presentation and Analysis	68
4.1 Introduction	68
4.2 Demographic Profile of Participants	68
4.2.1 Gender Distribution	68
4.2.2 Age Range	69
4.2.3 Family Income Levels.....	70
4.2.4 Parents'/Guardians' Education Level	72
4.2.5 Profile of Interview Participants	73

4.3 Access to ICT Devices.....	74
4.3.1 Personal ICT Device Availability	74
4.3.2 Frequency of ICT Device Use Outside School	76
4.3.3 ICT device availability at school.....	77
4.3.4 Frequency of ICT device use in the classroom.....	80
4.3.5 Satisfaction with the current use of ICT in education	82
4.4 ICT Skills and Training	82
4.4.1 Self-assessed ICT skill levels	83
4.4.2 Quality of ICT Training	84
4.4.4 Adequacy of ICT training in preparing students	85
4.4.5 Perceptions of Teachers Concerning Training on ICT Usage	86
4.5 Challenges in Accessing and Using ICT.....	88
4.5.1 Challenges in Accessing ICT devices at School.....	88
4.5.2 Challenges experienced in the classroom	91
4.5.3 Lack of Resources	93
4.5.4 Infrastructure Limitations	94
4.5.5 Challenges in Awareness and Training	95
4.5.6 Socioeconomic Factors	96
4.6 Summary of the Chapter	98
Chapter Five	99
Discussion of Findings.....	99
5.1 Introduction	99
5.2 Discussion of Findings from Learners.....	99
5.2.1 Access, Awareness, and ICT Usage in the Classroom	100
5.2.2 Awareness of ICT Benefits in Learning	101
5.2.3 Patterns of ICT Usage in the Classroom.....	103
5.3 Challenges Affecting Access, Awareness, and Use of ICT	104
5.3.1 Infrastructure and Resource Limitations.....	105
5.3.2 Skills Gap and Training Challenges	107
5.3.3 Socioeconomic Barriers and Digital Divide.....	108
5.3.4 Pedagogical and Institutional Challenges	109
5.3.5 Lack of Measures and Strategies for ICT Awareness and Access	110

5.4 Summary of the Chapter.....	111
Chapter Six	112
Summary, Conclusions and Recommendations	112
6.1 Introduction	112
6.2 Summary and Conclusions.....	112
6.3 Recommendations	116
References	118
Appendices	134
Appendix 1: Informed Consent for Children.....	134
Appendix 2: Informed Consent for Teachers	136
Appendix 2: Questionnaire for Learners.....	2
Appendix 3: Interview Guide With Teachers	10
Appendix 4: Ethical Clearance Certificate	11

List of Abbreviations and Acronyms

4IR	Fourth Industrial Revolution
AsgiSA	Accelerated and Shared Growth Initiative for South Africa
ATT	Attitude Towards Using
BI	Behavioural Intention to Use
CAPS	Curriculum and Assessment Policy Statement
COVID-19	Coronavirus Disease 2019
DBE	Department of Basic Education
FC	Facilitating Conditions
FET	Further Education and Training
GEAR	Growth, Employment and Redistribution
GET	General Education and Training
ICT	Information and Communication Technology
ICT4RED	ICT for Rural Education Development
IS	Information Systems
NDP	National Development Plan
NGOs	Non-Governmental Organizations
NPC	National Planning Commission
OBE	Outcomes-Based Education
PBC	Perceived Behavioural Control
PEOU	Perceived Ease of Use
POPI Act	Protection of Personal Information Act

PU	Perceived Usefulness
RDP	Reconstruction and Development Programme
RNCS	Revised National Curriculum Statement
SASA	South African Schools Act
SPSS	Statistical Package for the Social Sciences
TAM	Technology Acceptance Model
TPACK	Technological Pedagogical Content Knowledge
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
UNESCO	United Nations Educational, Scientific and Cultural Organization
UTAUT	Unified Theory of Acceptance and Use of Technology

List of Figures

Figure 1.1: TAM (Ventkatesh and Davis 2000)	24
Figure 4.1: Gender of Learners	699
Figure 4.2: Family's Monthly Income	71
Figure 4.3: Parents' Level Of Education.....	72
Figure 4.4: Frequency of ICT Use Outside School.....	75
Figure 4.5: Access to an ICT Device at School	77
Figure 4.6: Frequency of ICT use in the Classroom for Learning Purposes.....	80
Figure 4.7: Self-rating ICT Skills.....	82
Figure 4.8: Quality of ICT Training	83
Figure 4.9: Preparedness for using ICT in Studies.....	84
Figure 4.10: Challenges in Accessing ICT Devices at School.....	888
Figure 4.11: Challenges in Using ICT for Learning.....	89
Figure 4.12: Challenges in Experienced in Classroom.....	90

List of Tables

Table 1.1 Mapping Key Questions with the Theoretical Framework.....	25
Table 2.1 Mapping Key Questions with the Theoretical Framework	48
Table 3.1: Accessible population, Sample size and Sampling Techniques.....	55
Table 4.1: Age Distribution of Learners	70
Table 4.1: Profile of Interview Participants	74

Chapter One

1. Background and Introduction

This study, which specifically focuses on Finetown School in Gauteng Province, South Africa, examines the use of information and communication technologies (ICTs) in teaching and learning within the educational system. The use of information and communication technology, or ICT, has become essential in reshaping the global landscape. Information and Communication Technology (ICT) is a general term that includes a range of hardware and software technologies associated with protocols, sensors, software, transmission media, communication systems, and standards (Demestichas and Daskalakis, 2020). It comprises services like text and multimedia messaging, audio and video calls, radios, televisions, and network hardware, in addition to communication devices like computers, mobile phones, radios, and televisions (Sagar, Gaikwad, and Kakade, 2021). Although sometimes linked to more modern technological developments, ICT has a longer historical background encompassing print, radio, television, and telephone. ICT has become ubiquitous, bringing about teleological, social, political, and economic changes that have resulted in a network society centred around ICT.

Moreover, ICT tools have gained recognition for their use in a variety of industries, including business, healthcare, entertainment and education, especially during the COVID-19 pandemic. Researchers, policymakers, and educators worldwide are paying more and more attention to the use of ICT in education due to technological advancements (Al-Mamary, 2022). The rapid growth of ICT has also made it one of the most important topics discussed by education scholars (Ghavifekr, Razak, Ghani, Ran, Meixi, Tengyue, 2014). Information and communication technology (ICT) can offer a dynamic and proactive learning environment. This means that educational institutions, such as schools, that aim to equip pupils to live in a knowledge society should consider incorporating ICT into their curricula (Ghavifekr, Afshari and Amla Salleh, 2012).

Likewise, as part of the endeavour to create knowledge-led societies, nations like the Republic of Korea (Hwang, Yang, and Kim, 2010), Turkey (Cavas, Cavas, Karaoglan, and Kislal, 2009), Malaysia (Kannan, Sharma, and Abdullah, 2012), and the United Kingdom (Livingstone, 2012) have expanded and introduced ICT use in their educational systems. Modern technology is also being used by South Korea (Jang, Yi and Shin, 2016) and Singapore (Ng, 2010) to bridge the gap between schools and the wider society, foster creative and innovative teaching and learning, and strengthen administrative and management capacity. In both developed and developing nations, information and communication technologies (ICTs) are heralded as the solution to all problems facing educational systems and are seen as instruments that might revolutionize education by improving instructive and learning environments. As a result, Gauteng Province, in particular, has a large number of urban schools in South Africa that are equipped with ICT infrastructure to enhance the quality of instruction.

The roots of ICT integration in education can be discovered in the mid-1900s when the first computer-assisted instruction programs were developed (Baako and Abroampa, 2023). The introduction of personal computers, the internet revolution, and the growth of mobile technologies have all contributed to the acceleration of this integration throughout time, resulting in the diverse and networked digital learning environment of the twenty-first century. UNESCO also arranged the International Conference on ICT in Education in Qingdao, China, which produced the Qingdao Declaration, to emphasize the relevance and crucial role that ICTs will play in education going forward (UNESCO, 2015). According to Ghavifekr, Razak, Ghani, Ran, Meixi, and Tengyue (2014), this indicates that nations throughout the world acknowledge the value of ICT in enhancing educational systems and putting learners ready for the 21st-century learning society. As a result of ICTs' widespread adoption and infiltration, many countries have created national policies endorsing ICT use in education as a means of providing innovative methods to enhance the level of quality, efficacy, and efficiency of teaching and learning environments. For pedagogical and social reasons, instructors' and students' use of computers and

other connected technology, such as the Internet, in the classroom has thus become essential.

According to Livingstone (2012), the idea behind ICT integration in education is that these tools can improve educational skills across the curriculum by speeding up and augmenting teaching and learning. Likewise, the integration of ICT in the teaching-learning process has become crucial, with significant reforms taking place over the past decades. It reflects a paradigm shift in teaching and learning methodologies with schools leveraging diverse ICT tools. There is no doubt that teaching and learning processes are changing significantly as a result of the use of ICTs. Information Communication Technologies are helping to affirm and advance relationships between educators and students, reinvent the approaches to learning and collaboration, shrink long-standing equity and accessibility gaps, and adapt learning experiences to meet the needs of all learners.

In South Africa, information and communication technologies (ICTs) are acknowledged as fundamental to the country's society and educational system, and since 1996, South Africa has led the way in policy initiatives, realizing the transformative potential of ICTs. The advent of programs such as Khanya and Gauteng-On-Line made room for the 2004 e-Education policy, which sought to revolutionize teaching and learning through the use of ICTs. The Department of Basic Education (DBE) and the Gauteng Department of Education (GDE) emphasize how important it is to integrate ICTs into teaching and learning to address historical injustices. To realize and experience the potential of ICTs in enhancing student performance, the GDE set up ICT laboratories with internet connections to give access to ICTs for all teachers and students (Van Greunen et al., 2021).

In particular, Gauteng public schools received laptops and tablets in 2014 as part of the eLearning Solution project, which aimed to give students digital access to learning materials and develop an eLearning-friendly teaching culture (Makhura, 2015). The supply of electronic devices for teaching and learning was also done in line with the Gauteng government's goal of creating a smart, knowledge-based, and innovation-driven economy in the province (Makhura, 2015). However, the

integration presupposes a supporting infrastructure and calls for instructors to be tech-savvy and digitally literate (Mwapwele, Marais, Dhlamini, and Van Biljon, 2019). This raises questions regarding the extent to which educators in remote areas use ICTs and whether or not they have any support systems in place.

Despite the difficulties that teachers experience, learners, even in remote places are technologically savvy and expect their teachers to provide more academic content digitally. Therefore, in addition to possessing digital abilities, teachers are required to use technology to enhance learning (TLE) in a way that supports and improves the understanding of learners. The motivation behind this study, which addresses the issue of access, awareness, and use of ICT to support effective teaching and learning, stems from the dichotomy between the potential that ICTs have to support education, the dearth of adequate digital support for teachers, and the growing digital expectations of learners. This is significant since, despite all of its benefits, there are still South African schools without ICTs (Steyn and Van Greunen, 2014).

The studies by Behar and Mishra, (2015) as well as Goktas, Gedik, and Baydas, (2013) point out that in the rare cases where schools do have access to ICTs, they tend to use them sparingly and prioritize computer education or the development of students' ICT abilities over integrating ICTs into the classroom. Consequently, instead of being implemented with integration in which students use ICTs for learning and where ICTs are an essential component of teaching and learning practices, ICTs are deployed without integration. The challenge of ICT integration also finds expression in the South African White Paper on e-Education, which mentions the integration of ICTs into learning and teaching as one of the challenges that concern the adoption of ICT in schools. Moreover, the Department of Science and Innovation conducted a study in 2021 on the ICT readiness of schools in South Africa and revealed that while schools are aware of the necessity for ICT use and integration into the curriculum, they have not ingrained ICT in the leadership and vision of their institutions.

The South African government generally lacks resources, which means that infrastructure, technology, and training opportunities for teachers are not provided

optimally. Therefore, despite this, the government has partnered with businesses to help provide sufficient support, such as constructing and distributing ICTs in schools. A large portion of ICTs are given to schools without consideration for how beneficial they will be for the administration, instructors, and students (Bladergroen et al., 2012). Similarly, research has shown that while most teachers are excited about incorporating ICTs into their educational programs, many of them have aversions to doing so (Bladergroen et al., 2012). This speaks to teachers' attitudes and pedagogical ideas and the crucial role that they play in the acceptance and integration of ICTs in the classroom, in addition to the requirement for computer skills to do so (Nkula and Krauss, 2014; Alberola-Mulet, Iglesias-Martinez, and Lozano-Cabezas, 2021). These assertions show that there is a gap between the ICT policy in education and its implementation in schools. Thus, although ICT is employed in teaching and learning, research is needed to determine the extent of its usage. Thus, this study seeks to investigate access, awareness and the use of ICT to promote efficient teaching and learning at Finetown School.

1.2 Problem Statement

With the role that new information technologies have played in building a knowledge-based and network society, schools are considered critical spaces for preparing learners to participate fully in the emerging knowledge economy (Tiwari and Fahrudin, 2024). South Africa's national goals for ICT use in education, as outlined in the White Paper on e-Education (DBE, 2004), and further reinforced by the GDE eLearning policy (GDE, 2007), emphasize equipping learners with 21st-century skills so they may confidently enter the knowledge-based and networked society upon graduation. ICT in education is also intended to promote active knowledge creation among learners rather than passive information consumption.

Although the Gauteng Province has made significant investments in ICT infrastructure, including school internet connectivity and digital devices, a persistent problem remains: ICT resources are severely underutilized in township schools such as Finetown Secondary School (Moosa, Ncube and Ramnarain, 2023). Despite having some infrastructure in place, Finetown learners and teachers rarely use ICTs

for teaching and learning. This mirrors national and provincial patterns of low adoption, but the reasons behind this remain poorly understood at the school level.

Earlier studies (Van Wyk, 2014; Ford and Botha, 2014; Mlitwa and Koranteng, 2013) highlighted the underutilization of ICT resources and the reluctance of teachers to integrate technology into their practice. However, much of this research is now dated and does not account for new developments, such as the COVID-19 pandemic which exposed and deepened the digital divide or more recent provincial initiatives to expand eLearning (Ndulu, Ngwenya and Setlhalogile, 2022). These contextual shifts mean that the barriers and opportunities for ICT integration may look very different today compared to a decade ago. The specific issue at Finetown Secondary School is that, despite access to some ICT resources, Grade 11 learners who are at a crucial stage before matriculation have a minimal exposure to ICT for learning purposes. This demonstrates a mismatch between policy goals, resource provision and actual classroom practice forms.

Therefore, this study investigates the factors influencing access, awareness, and use of ICT at Finetown Secondary School with the aim of generating context-specific understanding as to why ICT remains underutilized despite policy support and partial infrastructure availability. The focus on Finetown is rooted in the need to contribute fresh, localized evidence on the persistent gap between ICT potential and practice in township schools.

1.3 Rationale of the Study

In a concise space of time, ICT has become a cornerstone of modern society, and South Africa has underscored the importance of the role that ICT plays in society and the education system. As a result, the country has introduced legislative and programmatic interventions to transform teaching and learning as spearheaded by the DOE. This is particularly important for the GDE, where the department distributed electronic devices (laptops and tablets) to be used by schools in the province. The introduction of ICTs in schools created new ways for teachers and

learners to engage in information selection, gathering, sorting, and analysis (Department of Education, 2004).

The sixth pillar of the Gauteng Department of Education's (GDE) strategic priorities, ICT in Education, aims to close the gap between ICT access and integration in schools and revolutionize the learning process. Additionally, the GDE priorities align with a more comprehensive national government ICT-related economic, social, and development agenda. ICT contributes to social development, economic progress, job creation, and global competitiveness at the highest levels of government (Dhlamini, 2021). Despite all this investment by the national and provincial departments in schools in the province's ICT infrastructure, ICT acceptance and integration in teaching is still behind the desirable level (Mashile, 2017), particularly in black townships and informal settlements.

During the COVID-19 pandemic, most ICT-equipped schools used online or blended learning to finish their curricula. Using ICT platforms like Google Classroom, Microsoft Teams, and WhatsApp groups, teachers were able to facilitate learning from the comfort of their homes. However, those without access to ICT tools and those without training in ICT integration were forced to wait for schools to reopen. According to Du Preez and Le Grange (2020:90), there is a stark digital divide in South Africa that has been exposed by the COVID-19 pandemic. When it comes to utilizing available ICTs to adapt to new teaching and learning methodologies, historically underprivileged schools are still finding it difficult to keep up with well-resourced schools. This calls for further research to investigate the extent of ICT usage in schools. It is for this reason that this study looked into issues of access, awareness and use of ICT to promote efficient teaching and learning among grade 11 learners at Finetown School.

1.4 Purpose of the study

This study seeks to investigate access awareness and the use of ICT to promote efficient teaching and learning at Finetown Secondary School in Johannesburg. The study will make a significant contribution to establishing the extent of ICT utilisation in South African schools, particularly in rural and informal settlements. This study

focuses mainly on access awareness and ICT usage. Issues such as the importance of ICT were not the focus of this study.

1.5 Research objectives

The study seeks to achieve the following objectives:

1. To determine access, awareness and ICT usage in the classroom for grade 11 learners.
2. To establish the challenges affecting access, awareness and use of ICT in promoting efficient teaching and learning in the classroom for grade 11 learners.
3. To determine the measures and strategies that are in place to raise access awareness and use of ICT in promoting efficient teaching and learning in the classroom for grade 11 learners.
4. To determine the ways to improve access, awareness and use of ICT for the promotion of teaching and learning in the classroom for grade 11 learners.

1.6. Key Research Questions

The study sought to answer the following specific questions:

1. What is the level of access, awareness and ICT usage in the classroom for grade 11 learners?
2. What are the challenges affecting access, awareness and use of ICT in promoting efficient teaching and learning in the classroom for grade 11 learners?
3. What measures and strategies are in place to raise access, awareness and use of ICT in promoting efficient teaching and learning in the classroom for grade 11 learners?
4. What strategies can be used to improve access, awareness and use of ICT for the promotion of efficient teaching and learning in the classroom for grade 11 learners?

1.7 Significance of the Study

The significance of this study is rooted in its potential to contribute to both theoretical and practical understandings of ICT integration in South African township schools. Existing literature has consistently acknowledged the importance of ICT in enhancing teaching and learning, with scholars such as Czerniewicz and Brown (2005) and Majumdar (2015) emphasizing the transformative role of technology in promoting interaction, integration, and access to knowledge across geographical boundaries. Research has also highlighted persistent challenges in ICT utilization, including limited infrastructure, lack of training and the reluctance of teachers to adopt new technologies (Van Wyk, 2014; Mlitwa and Koranteng, 2013; Steyn and Van Greunen, 2014). More recently, studies such as Ojo and Adu (2018) and Ndimbovu (2021) have examined ICT availability and usage in South African schools, focusing on issues of resources and general utilization. However, these studies often focus on rural schools and higher education institutions, with limited attention paid to township and informal settlement schools where the intersection of poverty, inadequate resources, and policy gaps creates distinctive challenges for ICT integration.

It is against this background that the present study derives its significance. The focus on Finetown Secondary School allows the research to provide context-specific insights into the ways access, awareness, and actual use of ICT unfold within an under-resourced township school. The study advances the application of the Technology Acceptance Model by examining how external variables such as inadequate infrastructure, limited training and socioeconomic barriers influence teachers' and learners' perceptions of ICT's usefulness and ease of use. In doing so, the study extends theoretical debates on technology adoption beyond the well-documented contexts of higher education and well-resourced schools to marginalized township settings that remain underrepresented in the literature.

The practical importance of the study lies in its potential to inform policy and practice. Despite significant investments in ICT infrastructure by both national and provincial governments, utilization rates remain low. The findings of this study are valuable to policymakers by explaining why ICT resources often remain underused and by

identifying targeted strategies for bridging this gap. For teachers and school managers, the study highlights the professional development, pedagogical, and technical support needs that must be addressed if ICT is to be effectively integrated into teaching and learning. Learners stand to benefit from enhanced access to digital skills, which are essential for participation in the knowledge economy and the Fourth Industrial Revolution.

Methodologically, the study contributes by employing a mixed-methods approach that integrates quantitative data from learners with qualitative insights from teachers. This design ensures a holistic understanding of both learner and teacher perspectives, providing a more nuanced account of the barriers and opportunities for ICT integration in township schools. In this way, the study is worth the time, effort, and expense because it goes beyond reiterating known issues of ICT underutilization to uncover the underlying reasons for this persistent challenge in Finetown. Its unique contribution lies in combining a township-specific focus with a theoretical framework that explains how access, awareness, and usage intersect to shape ICT adoption. The knowledge generated enriches academic discourse, provide context-driven evidence for policymakers, and offer practical strategies to ensure ICT integration moves from policy rhetoric to meaningful classroom practice, with tangible benefits for learners, teachers, and the education system as a whole.

1.8 Theoretical Framework

The Technology Acceptance Model (TAM) was used as the theoretical basis for this study. TAM views perceived utility and perceived usability as the key factors influencing how well technology is received (Grani and Maranguni, 2019). TAM's main goal was to shed light on the mechanisms underlying technology acceptance in order to forecast behaviour and offer a theoretical justification for the successful application of technology (Maranguni and Grani, 2015; Davis, 1989; Davis, 1993). Perceived usability and perceived usefulness are the two main elements in the fundamental TAM model that determine whether or not a person intends to adopt new technology. In order to gauge a user's adoption of technology, TAM explores how people engage with their devices (Camilleri and Camilleri, 2017). The practical

goal of TAM was to educate practitioners about possible actions they may take before putting systems into place (Kemp, Palmer, and Strelan, 2019). By defining the procedures that mediate the relationship between IS characteristics (external factors) and actual system use, Davis set out to construct the model of technology acceptance (Ibrahim, Leng, Yusoff, Samy, Masrom and Rizman, 2017).

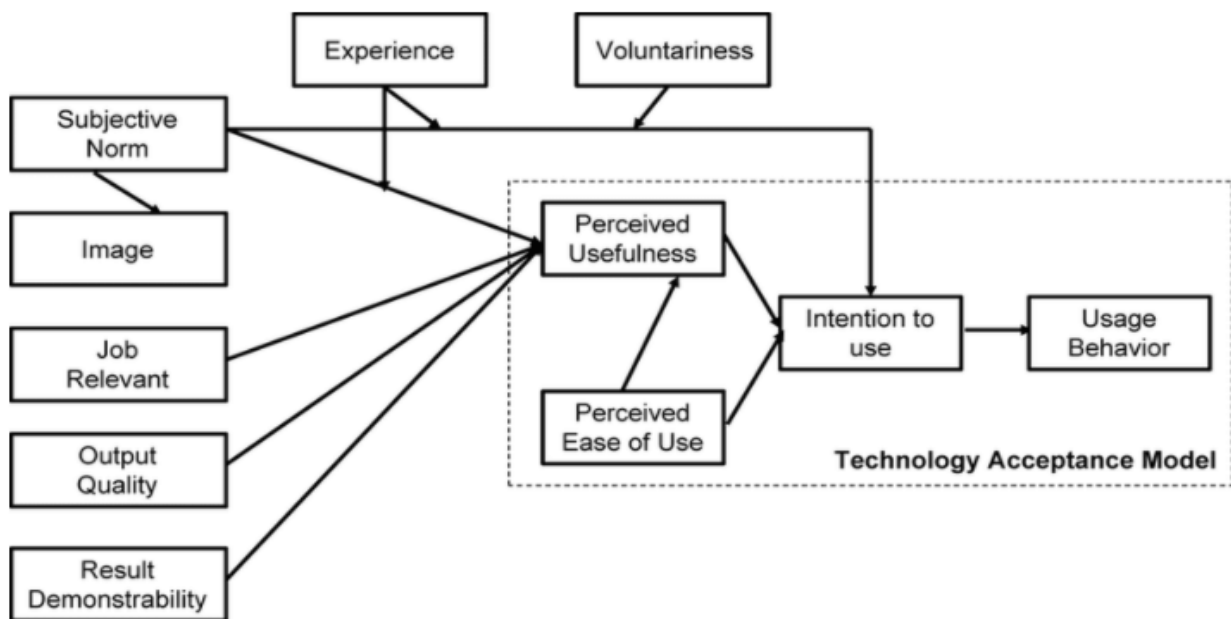


Figure 1.1 TAM (Venkatesh and Davis 2000)

Internationally recognized as an essential tool for teaching and learning, ICT is used in higher education. Despite its worth and success, there are many uncertainties regarding how to use it and how powerful it is. Additionally, there are inquiries regarding user readiness and awareness of ICT technologies. In order to preserve the long-term viability of education, schools and universities are battling difficulties related to learners' and even teachers' use of ICT in teaching and learning. It is against this background that this study adopts the Technology Acceptance Model as a theoretical framework in which to look at access awareness and the use of ICT to promote efficient teaching and learning at Finetown School in Johannesburg. The table below shows the link between the research questions to the model's constructs.

Table 1.1 Mapping Key Questions with the Theoretical Framework

Research Questions	Model Constructs
What is the level of access, awareness, and ICT usage among grade 11 learners?	Perceived Ease of Use (PEOU), Perceived Usefulness (PU)
What are the challenges affecting access, awareness, and use of ICT in promoting efficient teaching and learning among grade 11 learners?	Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Perceived Behavioral Control (PBC)
What measures and strategies are in place to raise access, awareness, and use of ICT to promote efficient teaching and learning among grade 11 learners?	Perceived Behavioral Control (PBC), Facilitating Conditions (FC)
What strategies can be used to improve access, awareness, and use of ICT to promote efficient teaching and learning among grade 11 learners?	Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Attitude towards Using (ATT), Behavioral Intention to Use (BI)

While TAM provides a strong foundation for analysing perceptions of ICT usefulness, ease of use, and behavioural intentions, it does not explicitly account for awareness as a distinct construct. In this study, awareness is treated as an antecedent variable that influences the extent to which learners and teachers form perceptions of ICT (PU, PEOU) and develop intentions to use it. In other words, without a baseline awareness of the availability and potential of ICT resources, constructs such as perceived usefulness and ease of use cannot fully materialize. The integration of awareness alongside TAM constructs allows the study to extend the model to fit the township school context, where awareness is not a given but a crucial precondition for technology adoption. This represents a unique contribution, as most TAM-based studies assume awareness and focus primarily on higher education and well-resourced environments.

1.9 Delimitations of the Study

Delimitations are characteristics that limit the scope and define the boundaries of the study (Simon, 2011). This research study involved only one school, Finetown Secondary School. This school is under the jurisdiction of Gauteng Province of South Africa. The study was limited to access, awareness and use of ICT to promote efficient teaching and learning among grade 11. The limitation of this study was time. The duration of the study was short, so the information obtained could be a fraction of many more things that are occurring in schools regarding the use of ICTs. To mitigate this shortcoming and ensure the findings remained acceptable, the study adopted two strategies. First, a mixed-methods approach was employed, combining quantitative data from learners with qualitative interviews from teachers, which allowed triangulation of data sources and enhanced the credibility of the results despite time constraints. Second, the study deliberately focused on a single case of Finetown Secondary School, which made it possible to collect in-depth and context-specific insights within the available timeframe. While the limitation of time is acknowledged, these measures helped ensure that the findings are both valid and useful for understanding the barriers and opportunities for ICT integration in township schools. This is confirmed by Simon (2011:2), who asserts that a study done over a period of time is a snapshot dependent on conditions occurring at that time.

1.10 Research Methodology

This study adopted a mixed-methods research approach, grounded within a positivist paradigm, to comprehensively investigate the issues of ICT access, awareness, and use. A descriptive research design was employed to accurately describe the characteristics of the phenomenon within its real-world context. Data was collected sequentially; first, quantitative data was gathered through structured questionnaires administered to a randomly selected sample of 170 Grade 11 learners at Finetown Secondary School. This was followed by the collection of qualitative data through in-depth interviews with eight purposively selected teachers. The integration of these methods allowed for both the generalizable measurement of trends and the in-depth exploration of underlying reasons, ensuring a robust and nuanced analysis. The

methodological choice was driven by the need to triangulate findings and obtain a complete picture that neither a purely quantitative nor qualitative approach could achieve alone.

1.11 Ethical Considerations

The study was conducted under the full ethical approval of the University of KwaZulu-Natal's Humanities and Social Sciences Research Ethics Committee. Upholding the highest ethical standards, participation was entirely voluntary. Informed consent was secured from all participants; specifically, parental consent was obtained for learners, who also provided their assent. Strict measures of anonymity and confidentiality were maintained throughout the research process. No identifying details of participants were recorded, data was stored securely on password-protected systems, and all information will be disposed of securely after a five-year retention period. These protocols ensured the protection, rights, and welfare of all individuals involved in the study.

1.12 Definition of Terms

Information and Communication Technology (ICT): According to UNESCO (2014), this is a broad term referring to digital technologies and tools, such as computers, mobile devices, and the internet, used to process, store, and share information. In education, ICT supports teaching, learning and administrative functions.

ICT Integration: This is defined as the process of embedding ICT into classroom practice to improve teaching and learning outcomes, moving beyond simple access to transformative pedagogical use (Voogt, Knezek, Cox, Knezek, and ten Brummelhuis, 2013).

Digital Divide: This usually refers to the disparity between individuals or groups who have access to ICT resources and those who do not, often shaped by socioeconomic status, geography, and institutional factors (van Dijk, 2020). In South Africa, this

divide remains significant between urban, rural, and township schools (Czerniewicz and Brown, 2014).

Access to ICT: This refers to the extent to which learners and teachers can obtain and use ICT devices, internet connectivity, and supporting infrastructure for educational purposes (Pelgrum and Law, 2003).

ICT Awareness: This is defined as the degree of knowledge, attitudes, and perceptions about the potential benefits and importance of ICT in education and daily life (Tondeur, van Braak, Ertmer and Ottenbreit-Leftwich, 2017).

ICT Use: This refers to the application of ICT tools by teachers and learners for various educational activities, such as lesson delivery, assignments, research and communication (Kurt, 2010).

Township School: In the South African context, this refers to a public school located in historically marginalized urban areas, often under-resourced and characterized by overcrowding and infrastructure challenges (Sayed and Motala, 2012).

1.13 Structure of the Dissertation

Chapter One provided a brief background and introduction to ICT with a particular focus on teaching and learning. It also outlined the problem statement, research questions and research aim. The chapter also provided a preliminary literature review and a discussion of TAM as a theoretical framework guiding this study.

Chapter Two presented a review of previous literature focusing on the use of ICT. It begins by giving a definition of ICT and how it has been adopted to promote efficient teaching and learning globally. The chapter then paid particular attention to South Africa, where this study is conducted.

Chapter Three presented a discussion and justification of the research methodology employed for this study. The chapter focused on the research approach, research strategy, data collection instruments, data analysis and ethical considerations.

Chapter Four provides a graphical presentation of the study findings. The chapter also provided a description of the data collected, including demographic information (gender, age, and education).

Chapter Five provided a detailed discussion of the findings.

Chapter Six provided a summary of key study findings, conclusions and recommendations based on the empirical study findings presented in Chapters Four and Two. This structure suggests that this is a qualitative study. Hence, it is essential that it aligns with the research methodology of the study, as it outlines how the study was conducted.

1.14 Summary of the Chapter

This chapter has provided an introductory overview of the study. It has highlighted the transformative role of ICTs in education globally and within South Africa, emphasizing the potential of ICT to foster dynamic learning environments while addressing educational disparities. The chapter has presented the problem under investigation, which pertains to the underutilization of ICT resources in South African schools. The rationale and significance of the study lie in the need to address the digital divide in informal settlements, and this aligns with national goals aimed at equipping learners with 21st-century skills. It outlines four key research questions that explore access, challenges, existing strategies, as well as the potential improvements for ICT integration. The chapter concluded by outlining the structure of the dissertation.

Chapter Two

Literature Review

2.1 Introduction

The previous chapter provided an overview of what the researcher intends to investigate regarding the access, awareness and use of ICTs to promote efficiency in teaching and learning. This chapter provides a brief discussion of the concept of ICT. Attention is paid to the digital revolution and the digital divide. The following literature review provides an overview of the education system in South Africa and the role of ICT in this system. It also gives a discussion of legislative frameworks guiding ICT usage in education in South Africa. Lastly, a discussion of the theory underpinning this study is provided.

2.2 ICT as a Concept

The late 20th and early 21st centuries have witnessed significant shifts in the economy and society, many of which have been made possible by or directly linked to a sharp rise in the availability and power of information and communications technologies (Serrat and Serrat, 2021). ICT's power has expanded dramatically, resulting in a significant increase in its impact. ICT encompass a wide variety of technologies. Although frequently associated with computers, the term also encompasses various forms of informative media, including print, radio, television, and handheld devices (Chayko, 2020). It is possible to combine these information technologies with communications technologies like networks and phones (Serrat and Serrat, 2021). The power of the term stems from the convergence of the ever-increasing information processing capabilities of computers and the information exchange capabilities of networks, even though this definition hardly leaves anything out (Barefoot, Curtis, Jolliff, Nicholson and Omohundro, 2018). Earlier technologies, such as radio and television, could not initiate the global socio-economic paradigm shift that modern ICT has, and this has been made possible by its combined processing and networking capacity.

UNESCO (2019) defines ICT as a scientific, technological, engineering, and management approach used to handle information and its application in relation to social, economic, and cultural issues. Chen, Castillo, and Ligon (2015) define ICT as a collection of instruments that facilitate, assist and bolster educational transformation. ICT is typically included in government assessments of education (Hernández-Ramos, Martínez-Abad, Peñalvo, García, and Rodríguez-Conde, 2014). Mdlongwa (2012) defined ICT as a "global network in which ideas are exchanged, or information and knowledge are shared, through using technology like computers and communication devices like cell phones to connect people." The body of research on the application of technology in education is vast and complex, encompassing both qualitative and quantitative studies. It contains numerous definitions for terms such as access, use, and technology (Hart, 2023).

While these definitions demonstrate the breadth of ICT as a concept, they also highlight a key analytical challenge linked to the fact that ICT is simultaneously understood as a tool (Chen et al., 2015), a network (Mdlongwa, 2012) and a management and systemic approach (UNESCO, 2019). Such definitional diversity risks diluting the term into an umbrella concept that lacks precision. This creates difficulties when comparing studies or evaluating policy outcomes, as ICT access may refer to physical infrastructure in one study and digital literacy in another (Hart, 2023). Therefore, in educational research, it is essential not only to catalogue definitions but to adopt a critical lens that clarifies which conceptualisation is most relevant for a given study. For the purposes of this dissertation, a functional definition that emphasises ICT both as a set of tools and as a pedagogical enabler in classroom contexts is most appropriate as it connects national policy ambitions with the realities of learner and teacher practices.

2.3 South African Education System and the Rise of ICT in Education

The historical legacy of apartheid has left South Africa with one of the most unequal education systems in the world (Spaull, 2015). A system of racial inequality that denied the black population equitable access to and results from education served as the foundation for both colonialism and apartheid. The effects of educational

inequality are evident when considering South Africa's current educational levels, where students from lower socioeconomic backgrounds typically perform worse academically due to the quality of education they receive (Spaull, 2015). According to Dansi and Amedzo (2014), among other things, a shortage of classrooms, power, and landlines are among the fundamental essentials that often plague rural schools (see also Madoda, 2018). Therefore, the foundation of post-1994 education policy is the idea of equality of opportunity, encompassing availability, accessibility, and outcomes. This provides an important backdrop for ICT integration, as without basic infrastructure, such as electricity, classrooms, and connectivity, the promise of ICT in education is severely undermined.

According to Badat and Sayed (2014), post-1994 education was expected to meet and address the needs of all citizens as well as the new state's requirements for social and economic development. Post-apartheid challenges and the creation of a new system based on the Constitution Charter's dictum that "the doors of learning and culture shall be open to all" have significantly affected South Africa's education transformation during the past 30 years (Cloete, 2014). The changes and transformations in the educational sector did not occur in a vacuum. Instead, the unique characteristics of the inherited educational system, particularly the legacy of apartheid's unequal access, spending, opportunity, and outcomes, determined the changes in the education sector (Badat and Sayed, 2014). The new government would, therefore, have to gather a great deal of funding in order to eradicate apartheid's educational legacy. However, a plethora of transformation-focused programs have emerged over the last 30 years. This helps to contextualise why ICT adoption has often been uneven. Reform energy has been spread across curriculum, equity and resourcing, with ICT often positioned as an add-on rather than a core driver of reform until much later.

After 1994, the inherited and current order was explicitly considered when framing educational objectives. Thus, the values of human dignity, the achievement of equality, and the advancement of human rights and freedoms, as well as "non-racialism and non-sexism, were proclaimed in the 1996 South African Constitution,

which outlined the nature of the society that was envisaged (Republic of South Africa 1996a, Section 1). Following the landmark National Education Policy Act, there was an explosion of policy activity that resulted in the creation of acts, rules, white papers, and other materials aimed at revolutionising the country's educational system (Sayed and Kanjee, 2013). These laws all maintained that real equality could not be achieved without a strong governmental commitment to support people who had been disadvantaged. Yet, the recurring criticism in the literature is the implementation gap, which pertains to the fact that progressive policies often fail to translate into classroom-level change, particularly in ICT integration, where resources and capacity building lag behind policy ambitions.

Furthermore, since 1994, the government's broader and contested macroeconomic developmental plans have shaped the changes to educational policy. Originally, modifications to education policy followed the 1994 Reconstruction and Development Programme (RDP), which had the objectives of democratizing the state and society, developing human resources, and meeting the basic needs of people" (Badat and Sayed, 2014). The Growth, Employment and Redistribution (GEAR) program then started to shape state goals and condition educational change starting in 1996. It has been referred to in some circles as a neoliberal macroeconomic policy (Badat, 2008). Programs and priorities of the government were later shaped by the Accelerated and Shared Growth Initiative for South Africa (AsgiSA). More recently, the National Planning Commission (NPC) diagnosed problems and challenges in South African society generally and in education more specifically. As with AsgiSA, the NPC's National Development Plan 2030 created a macro framework for social change in South Africa. In the sphere of education, the policy seeks to ensure that by 2030, South Africans have access to education and training of the highest quality, leading to significantly improved learning outcomes (National Planning Commission, 2013; see also Khunoethe and Reddy, 2023). This shows how ICT adoption cannot be separated from wider macroeconomic and policy frameworks. This speaks particularly to the tension between developmental and neoliberal agendas, which may explain why ICT rollouts often emphasise cost efficiency and international competitiveness rather than grassroots equity.

In basic education, the South African Schools Act of 1997 established a new system of school governance. The National Norms and Standards for School Funding (DoE, 1998) established a more equity-focused form of school financing, and Outcomes-Based Education (1997), a curriculum reform, was implemented. The adoption of Curriculum 2005 (C2005), which saw the complete implementation of Outcomes-Based Education (OBE) in Grade 12 by 2005, and the implementation of OBE in the GET band in 1997, demonstrates the DBE's common commitment to reforming South Africa's educational system. A system of education called OBE replaced the race-based one, catering to all South African students, regardless of their race or socioeconomic status. With a system of specified critical goals that included problem-solving, collaboration, and critical thinking, this new educational regime attempted to promote learner-centred pedagogy by emphasizing skills, knowledge, and values (Nkadimeng, 2022). Following the C2005 review, the Revised National Curriculum Statement (RNCS) was created in 2002 (Bonga, 2023). Its overall goals were to promote conceptual coherence, social justice, equity, and social development through the development of critical, creative, and problem-solving individuals. It was also intended to have a clear structure and be written in an easily understood language (Ngoben, Chibambo, and Divala, 2023). Curriculum reforms have repeatedly introduced learner-centred pedagogies that align with ICT use, yet the lack of adequate infrastructure and teacher training has often limited their practical impact.

According to Mukhari (2016), RNCS acknowledged that OBE concepts, such as own pace, were unachievable. Government officials, educators, parents, and students lost faith in state schools in favour of private ones as a result of the difficulties (Mouton et al., 2012). Kokela (2017) asserts that relevance, equity, and quality are the three main issues that still beset South African education. Due to the ongoing challenges, a new curriculum, the Curriculum and Assessment Policy Statement (CAPS), was introduced in 2011 with the goal of raising the standards of instruction in educational institutions. Among many other things, the emphasis on topic understanding and dedication to active learning were among the modifications in the new curriculum (Hoadley, 2017). While CAPS streamlined earlier curriculum

complexity, critics argue it has not substantially improved ICT integration, as digital skills are often treated as peripheral rather than embedded across subjects.

The adoption of two distinct education systems has not improved the South African education system; rather, it has increased national issues and exposed flaws in both planning and implementation (Engelbrecht, 2020). For educators who never fully grasped the tenets of the curriculum systems implemented after 1994, the implementation of new educational systems posed an enormous challenge. Many stakeholders are disenchanted with the education ministry's constant changes, as they have led to poor performance from both teachers and students in South Africa (Mukhari, 2016). In light of this, it became essential for South African teachers and pupils to adopt innovative teaching practices in order to compete with their international counterparts in the field of education. To become knowledge creators rather than just consumers, educators and students must meet international standards for knowledge, ICT proficiency, creativity, and innovation. The kind of learners found in the new information era, when technological devices are a part of daily life, support learning with ICTs (Mukhari, 2016). This instability also undermines ICT integration, as teachers already struggling with shifting curricula are also reluctant to adopt new technologies without consistent and long-term support.

In modern times, learners are expected to engage actively in their education as opposed to merely receiving knowledge from authoritative teachers in a passive manner (Condy and Phillips, 2020). The support of active and authentic learning to create an environment where learners participate in cooperative learning and use higher-order thinking skills throughout their educational experiences is another crucial component of education in the information age. According to Jerald (2009), these qualities are of great importance in 21st-century education and are deemed essential in preparing learners for their future workplace in the network society where ICTs are ubiquitous. These advancements would greatly benefit South Africa's education system, which is hampered by inequality in class size, infrastructure, facilities, and a shortage of qualified educators (Spaull, 2015). This aligns closely with global ICT integration trends; however, South Africa's persistent inequalities in

class size, infrastructure, and qualified teachers risk excluding many learners from such opportunities (Spaull, 2015). Moreover, technological advancements in schools can equip educators and learners with the digital skills necessary for the Fourth Industrial Revolution (4IR) (Cowin, 2021). However, literature increasingly warns against uncritical adoption of the 4IR discourse, arguing that without addressing basic resource inequalities, 4IR readiness may remain aspirational rather than practical for most South African learners.

Given the aforementioned, many South African school systems, along with those worldwide, are implementing a creative paradigm shift to convert traditional classrooms into digitally enabled smart classrooms (Dlamini and Ndzinisa, 2020). Makwela (2019) highlights the efforts and steps implemented to encourage the adoption and use of digital technology in South African schools, as seen by projects like the Gauteng Paperless Classroom and ICT for Rural Education Development (ICT4RED). ICTs are essential to education in South Africa, even with the challenging conditions for teaching and learning that exist there (Draper, 2010). An unprecedented shift in instructional methods and knowledge representation was sparked by the introduction of ICT in education (Dlamini, 2021). These initiatives highlight important progress, yet evaluations suggest that pilot projects often struggle to scale, leaving many schools, particularly those in rural areas, without sustained ICT access and integration strategies.

2.4 ICT Integration in South Africa

Similar to the digital divide, there are various definitions for ICT integration, but in general, it refers to the use and control of digital technologies to improve pedagogy in the classroom (Khan, 2023). Successful ICT integration is the creation of an environment in which educators and learners use ICTs to use and build their information abilities (Lawrence and Tar, 2018). This definition reflects a shift in educational discourse away from mere access to a more holistic understanding of integration, emphasising the transformation of teaching and learning processes rather than technology adoption alone. According to their article on the integration of ICT in South African classrooms, adoption and integration of computers is a

challenging and complex process for schools and teachers, particularly where there is limited previous experience in the use of ICTs, which emphasizes the significance of teachers and their training in this area (Lawrence and Tar, 2018). Moreover, teachers should utilise ICT to produce knowledge and ensure that learners become developers of their own knowledge through ICT usage and integration (Ghavifekr and Rosdy, 2015). Here, the emphasis on active learner engagement aligns with constructivist approaches to pedagogy; however, the literature repeatedly notes that without sustained professional development, teachers' capacity to achieve this remains constrained.

According to Durodolu and Mojapelo (2020), when there is advancement in ICT within an institution, the primary focus is on the operation and functionality of the technologies. This is especially pertinent in the context of South Africa. It is against this backdrop that scholars must examine the ICT integration in the field of education. It is important to evaluate whether or not ICT integration occurs in public and rural schools. This aligns with a study examining the use of ICT in education within low-income and marginalised socioeconomic contexts, focusing on access, awareness, and usage (see Simuja, 2018). This raises a critical point: integration is not only a technical matter, but also one of equity. The interplay between infrastructural provision and meaningful pedagogical use is starkly visible in rural and under-resourced settings.

ICT, in the words of Lawrence and Tar (2018), has transformed traditional modes of instruction and learning into online and virtual spaces. The introduction of ICT into the educational system has created a plethora of opportunities. ICT facilitates digital learning, which improves instruction and learning in the classroom. According to Makwela's (2019) study, ICT is significant and has several advantages for both teachers and students. Similarly, Mdlongwa (2012) asserts that incorporating technology into the curriculum has enormous advantages for every student. Mdlongwa (2021) further points out that exposure to ICT enables learners to become knowledge creators as well as to acquire skills that will give them an advantage in an increasingly technologically advanced workplace. This reinforces the aspirational

dimension of ICT integration; however, as the South African experience shows, the challenge lies in translating aspiration into sustainable classroom practices across diverse contexts.

While Dhlamini (2021) acknowledges that the use of ICT in education has been controversial, she also believes that, due to its numerous pedagogical advantages, it cannot be ignored. Furthermore, Mdlongwa (2012) and Khan (2023) are of the view that e-learning has been hailed as a means of revolutionising education and learning in the twenty-first century, underscoring the significant academic advantages learners derive from ICTs and the incorporation of technology into the classroom. This was made clear by the coronavirus epidemic, and the rise in popularity of online learning and education attests to its significance (Khan, 2023). COVID-19 indeed magnified both the potential and the gaps of ICT integration, exposing inequities in access and teacher preparedness. It is crucial to note, nevertheless, that ICT integration is sometimes mistaken for substitution. While substitution refers to using digital technology to replace conventional teaching methods, integration of ICT refers to the effect of integrating ICT into teaching and learning for a meaningful end that might not have been accomplished without the use of ICT (Khan, 2023). This distinction is central in evaluating ICT integration: mere access or digitising existing practices does not constitute integration unless it transforms pedagogy and learning outcomes.

Mukhari (2016) revealed that teachers and principals support ICT integration in the classroom because they recognize how it can improve methodological strategies, foster greater teacher collaboration, improve access to necessary information, and accommodate learners of varying abilities and learning preferences. To ensure that ICTs are accepted, principals play a crucial role. They are responsible for leading the group and establishing an environment where ICTs can be effectively utilised (Steyn and Van Greunen, 2014). Ensuring integration depends in part on the principal's motivation and attitude. When introducing or integrating ICTs into new developing contexts, it is crucial to keep the leadership of the school in mind. This highlights the role of leadership in shaping a school's ICT culture, as without

supportive leadership, even well-resourced schools may struggle to embed ICT meaningfully.

As some academics contend, one of the core areas affected by the digital divide is ICT integration. Khan (2023) provided evidence of this when they looked into how information, communication, and technology (ICT) were integrated into schools located in low-income socioeconomic contexts. The majority of respondents to the survey expressed optimism about the incorporation of ICT in their classrooms, although they emphasised that such integration was contingent upon having sufficient resources and ongoing training. As noted by Steyn and Van Greunen (2014), few schools use ICT integration, or teaching with or through ICTs. Because of this, the authors then advocate for a change in the way ICTs are introduced and integrated: from implementation without integration to integration with implementation that takes context into account. This recommendation is vital, as it acknowledges that ICT integration must be contextually grounded, particularly in South Africa, where resource disparities are vast.

According to Ndlovu and Lawrence's (2012) study, which examined the quality of ICT use in South African classrooms, some teachers still primarily utilise ICTs to convey subject matter, rather than leveraging the tools to enhance learning. Despite the fact that the Department of Education's (2004) ICT in Education policy emphasizes the pedagogical integration of ICTs to foster the development of higher-order thinking skills, this nevertheless occurs. This reveals a persistent gap between policy intent and classroom practice, suggesting that ICT integration requires not only infrastructure but also pedagogical transformation. The successful integration of ICT in schools is hindered by several factors, particularly in rural areas. These factors include, but are not limited to, inadequate ICT infrastructure, low ICT proficiency and skill levels among teachers, inadequate training, negative attitudes, and low teacher confidence. This highlights the multidimensional nature of the barriers to integration, such as technical, pedagogical, and attitudinal factors that interact and reinforce one another.

According to Ndlovu and Lawrence (2012), in order to fully utilize the potential of digital devices and foster the kind of critical thinking that is a crucial component of improving student performance, educators must possess both competence and innovative thinking. As noted by Kempkey (2016), teachers must comprehend the complex relationship between three knowledge bases that include technological knowledge, pedagogical knowledge, and content knowledge. In light of this, technology might contribute to the solution for education. The affordances of technology are undeniable, but educators also need to modify their methods and adopt the constructivist pedagogical approach, which is linked to the incorporation of technology into the classroom (Dlamini and Ndzinisa, 2020). This aligns strongly with global calls for blended learning and 21st-century pedagogies, but requires sustained investment in teacher capacity building.

Reich (2020) holds the opinion that merely having access to technology and implementing digital learning platforms will not result in educators' teaching methods changing significantly. Rather, educators must also possess 21st-century competencies and receive training in educational strategies that make use of digital technologies. This is significant in light of the study conducted in the Gauteng province by Dlamini (2021) to determine the factors limiting the adoption of ICT in schools. That study found that teachers' lack of experience integrating computers into the classroom and their limited knowledge of technological pedagogy had an impact on the uptake of ICT. This underlines that integration is as much a professional development issue as it is a technological one.

Research has indicated that there are gaps in the coordination of ICT implementation in the Gauteng province. This is because, although some teachers have received training in ICT, they are employed in schools without ICT infrastructure (Mosehlana and Sebola, 2020; Dlamini, 2022). Nevertheless, because they are not keeping up with the demands of their learners, some educators feel that they have gone digitally bankrupt (Dlamini, 2022). Therefore, it is vital to elevate educators' ICT proficiency and their understanding of digital technologies to a satisfactory level within their field of work. A greater understanding of the role that ICT plays in teaching, learning, and

transformative pedagogies can be developed by advancing instructors from the adoption stage to the adoption and implementation stage (Mosehlana and Sebola, 2020). This highlights that ICT integration is a process that requires progressive capacity building rather than one-off interventions.

When it comes to utilizing available ICTs to adapt to new teaching and learning methodologies, historically underprivileged schools are still finding it difficult to keep up with well-resourced schools (Ndlovu and Lawrance, 2012). On the other hand, Ojo and Adu (2018) believe that the way teachers use the resources at their disposal to teach is more often the issue than a lack of them. This was demonstrated in a study conducted in Eastern Cape schools, which found that ICTs support teaching and learning, and that most facilities in Eastern Cape high schools are not being utilised by learners and educators for their intended purpose (Ojo and Adu, 2018). It is for this reason that the authors so strongly advise the South African government to take a leading role in improving the efficiency with which both instructors and students use ICTs in high schools. This points to a crucial policy gap that resource provision must be accompanied by systematic support for teacher adoption and curriculum integration.

In their study on integrating ICT into rural South African schools, Dansi and Amedzo (2014) noted that NGOs, the business sector, and parastatals are collaborating to support government initiatives. To support their argument, they cited projects including Microsoft's collaboration with the Department of Basic Education, South African Digital Partnership, and Schoolnet. Dansi and Amedzo, 2014). While it is evident that urban schools are performing well in terms of ICT access, rural schools are not doing as well, which contradicts the principles of social justice. Dansi and Amedzo's (2014) study also showed that the primary challenges to ICT integration in South African rural schools include a lack of infrastructure, a shortage of qualified ICT staff, exorbitant costs, and the Department of Education's incapacity to maintain programs. Dlamini, Gamede, and Ajani (2021) also cited these difficulties, adding to the list of challenges, including financial limitations, inadequate training for integrating ICT into various subject areas, a deficiency in curriculum designed

specifically for teaching computer skills, and a lack of time for lesson planning. These findings illustrate how the digital divide manifests not only in access but in the capacity to integrate technology meaningfully, especially in rural schools. The finding made by Dzansi and Amedzo (2014) that certain remote schools are utilising computers despite their lack of fundamental infrastructure is noteworthy, as it provides a foundation for what is needed to integrate ICT into the educational process. Such cases underscore the importance of agency, innovation and localised strategies in overcoming structural barriers.

Nevertheless, several studies have proposed different ICT strategies to address the unique obstacles of ICT integration in South African schools and other similar settings (Bothma, 2023; du Plessis, 2021). It is abundantly evident that teachers' reactions to the integration of ICT into the classroom are influenced by their digital fluency. It may be argued that having access to ICT infrastructure is essential, but teachers' use of ICT tools to improve education could be influenced by their confidence and command of digital skills. The necessity of educating educators to use information and communication technologies (ICTs) for teaching and learning has been acknowledged by numerous South African studies over the years (Dlamini and Mbatha, 2018; Chisango, Marongwe, Mtsi and Matyedi, 2020; Ojo and Adu, 2018). Thus, ICT integration is a systemic issue requiring attention to infrastructure, capacity building, leadership, policy coherence, and contextual adaptation.

2.5 Access to ICT Infrastructure and Resources in South African Schools

In South Africa, the government has long recognised the importance of ICT infrastructure in schools as a foundation for digital learning. The SA Connect programme, adopted in 2013, was designed to provide broadband access to all government facilities, including schools, as part of a national digital transformation agenda (Department of Communications and Digital Technologies, 2013). Despite this ambition, implementation has lagged. By the end of Phase 1, only 594 schools had been connected at speeds of 10 Mbps (Department of Basic Education, 2022). In 2022, the Cabinet approved Phase 2 of SA Connect, aiming to connect 19,036 schools nationwide (DBE, 2022).

Yet, the gap between policy ambition and reality remains stark. Reports indicate that as of 2021, only 20% of schools were connected to the internet for teaching and learning, while an additional 29% were connected for administrative purposes only (ITWeb, 2021). Analysts have warned of a looming digital disaster as more than 16,000 schools remain unconnected (Extensia, 2022). The disparity highlights the persistent policy–practice gap, where ambitious policy statements are undermined by inadequate funding, implementation challenges and technical obstacles.

At the provincial and district levels, research highlights the uneven distribution of ICT access. A study in the Tshwane West District found that while schools reported improvements in ICT provision, internet access remained patchy and inconsistent, severely limiting teachers' ability to integrate ICT in everyday lessons (Mnisi, Mtshali and Moses, 2024). This mirrors findings from the Survey of ICT in Schools in South Africa (DBE, 2019), which revealed that only 31% of schools had some form of internet connectivity, with just 6% reporting classroom internet access. The same report showed that wealthier quintile schools had significantly better device–learner ratios than poorer ones, demonstrating structural inequalities (DBE, 2019). Similarly, Padayachee's (2017) snapshot survey indicated that teachers frequently cited unreliable infrastructure, including power outages, network downtime, and non-functional computers, as barriers to ICT integration. This indicates that even when resources are available, their usability is compromised by maintenance and reliability issues.

The literature demonstrates three key issues relevant to this dissertation. Firstly, it highlights a policy–practice gap, where, although the state promotes ICT through strategies such as SA Connect and the White Paper on e-Education, the majority of schools remain either unconnected or connected only for administrative tasks (DBE, 2019; ITWeb, 2021). Secondly, it reveals the inequality across school types and provinces, with urban and wealthier quintile schools benefiting from relatively better infrastructure, while rural and township schools continue to face severe deficits (DBE, 2019). Finetown Secondary School, located in a township context, fall on the disadvantaged side of this divide. Finally, it demonstrates data gaps at the classroom

level. Most studies provide aggregate data at the school or provincial level, but there is a lack of micro-level research that documents device-to-student ratios, internet uptime, and classroom-level connectivity logs for specific grades. This study contributes to the literature by documenting ICT infrastructure specifically in Grade 11 classrooms at Finetown, providing evidence on how infrastructural limitations affect senior secondary learners preparing for high-stakes examinations.

2.6 Awareness of ICT among Teachers and Learners

The available literature on ICT reveals considerable variation in levels of awareness and readiness to use among teachers and learners in South Africa. One study found that, despite financial, technical, and digital skills constraints, many rural teachers express optimism about integrating ICT into their teaching and learning (Mwapwele, Marais, Dlamini, and van Biljon, 2019). The study also identified institutional constraints such as restrictive policies banning the use of personal digital devices by students, which conflict with broader connectivity and digital readiness goals (Mwapwele et al., 2019). In KwaZulu-Natal, a study of Engineering Graphics and Design (EGD) teachers found that many teachers believe ICT integration is essential, but readiness is hindered by a lack of ICT skills and inadequate resources. Those who have used ICT tools tend to use basic functionalities, while higher-level pedagogical integration is limited (Mlambo, Maeko and Khoza, 2023).

Beyond teachers, some studies also address learners' awareness. News reports and policy initiatives, such as cyber labs, show that government efforts are being made to create ICT awareness among learners via infrastructure and cyber learning spaces (SA News, 2023). However, awareness does not always translate into digital literacy or the ability to use ICTs for curriculum-relevant tasks; many learners are familiar with social media and phones, but less so with educational platforms, critical evaluation, or ICT for formal learning (Mwapwele et al., 2019). Another dimension is in teacher education. A study on enhancing the integration of ICT in South African teacher education programmes found that many teacher training institutions, especially in historically underprivileged areas, have been slow to adequately emphasise ICT pedagogy. This results in newly qualified teachers having variable

awareness of how to integrate ICT meaningfully, beyond just operating devices (Mavuso and Makeleni, 2022).

The literature indicates that awareness encompasses several components, including technical, pedagogical, and learner-side digital aspects (Mlambo et al., 2023; Mavuso and Makeleni, 2022). Studies also demonstrate that the quality of training matters, as it is not enough that teacher training exists; what matters is *what* is covered. The EGD teachers' study reports that many trainings are basic in nature. Deep training on content creation, assessment modalities, and student-centred digital pedagogies is underrepresented (Mlambo et al., 2023). Studies done in South Africa also reveal learner awareness gaps in that, while device familiarity is relatively common, there is less evidence that learners have awareness of how to use ICT in rigorous academic or evaluative ways (for example, using online learning platforms, researching in safe and critical ways, or producing digital content), particularly in disadvantaged or rural contexts. Mwapwele et al. (2019) expose policy and institutional constraints, highlighting that teacher optimism and awareness are often constrained by institutional rules or a lack of support.

2.6 Utilization of ICT in Teaching and Learning Practices

Studies have demonstrated that when infrastructure and awareness are present, utilization of ICT in South African schools varies widely in type, depth and frequency. One study found that teachers who are reasonably well-resourced tend to use ICT for presenting visual content, digital slides, and accessing online resources; however, more interactive uses (such as student collaboration, formative assessment, and blended/hybrid learning) are much less common (Mlambo et al., 2023). In rural schools, Mwapwele et al. (2019) observed that although many teachers believe in ICT's potential, its usage is constrained by unreliable connectivity, a lack of devices, and restrictive policies. Even when devices are available, they are often shared or confined to one class, and usage tends to be teacher-centred rather than learner-centred.

In the Eastern Cape, Seleke (2023) found similar patterns, highlighting that ICT is used when possible for presentations and downloading resources, but the widespread adoption of more complex pedagogic practices remains rare. Some schools have adopted blended learning approaches. A recent study found that in-service training can increase teacher confidence and adoption of blended modalities; however, its use is uneven, often dependent on infrastructure, time, and support (Teane, 2024).

The literature supports a path where without access and awareness, there is little meaningful or frequent utilization of ICT (Mwapwele et al., 2019; Seleke, 2023). Many studies report frequency, but depth is less documented. The literature also shows that infrastructure reliability, teacher training, institutional policy, subject area and teacher beliefs and attitudes are moderators of utilization (Mlambo et al., 2023; Seleke, 2023; Mwapwele et al., 2019).

2.7 Digital Divide

According to the literature, several issues exist with the concept of the digital divide. Why does it happen where it occurs? What causes it? How should it be measured? Which parameters are relevant? How big is the digital divide, and to what extent does it exist? Where is the most important point? What short-term consequences may one expect from it? long-term? What actions must be taken to make it better? However, it might be difficult to provide a definitive response to every one of these questions. Nonetheless, the fact that ICT has grown exponentially and has not been disseminated equally within and between countries makes the issue of the digital divide an interesting theme to be included in this study.

Scholars have recognized the concept of the digital divide as a means of illustrating the disparities in digital capabilities between two socioeconomic groupings. The most widely used definition of the term digital divide, according to Van Deursen and Van Dijk (2019), is "a division between people who have access to and use digital media and those who do not." In the early years of the debate, the emphasis was on the term 'access,' but later on, it shifted to the word 'use.' Prior to the term "digital divide,"

various other terms were used, most of which related to the concepts of the information society and (in)equality, including knowledge gaps, information inequality, and information society participation (Ragnedda and Muschert, 2017).

The digital divide in schools, according to South African academic Mdlongwa (2012), refers to the disparity between those who are well-versed in the use and application of ICT in schools and those who are either novice or part-time users of this technology. According to other scholars, both internationally and locally, such as Mashile (2017) and Van Deursen and Van Dijk (2019), the digital divide encompasses inequalities in resources, training, and the integration of ICT in education, as well as differences in how ICT is used and implemented in the classroom. As such, it is a social and policy issue related to equity and equality. It is essential to discuss disparities based on physical ability, gender, economic status, race, and geography when discussing the digital divide in the South African setting. Contrary to popular belief, the digital divide is unquestionably the result of a complex interplay of social, economic, cultural, and political factors (Mathrani, Sarvesh, and Umer, 2022). Given that South Africa's education system was founded on the legacy of apartheid after independence, the racial component is significant in the discussion of the country's digital divide. Given the circumstances in which South Africa finds itself, one's economic standing plays a crucial role in determining one's position within the digital divide. The digital divide is evidently a wider development issue rather than just a question of access to computers and connectivity. It is situated within broader geopolitical trends and frequently aligns with a nation's Human Development Index ranking (Ionescu, Zlati, Antohi, Cornea, and Socoliuc, 2023).

In the context of this study, the term 'digital divide' may be used to characterise the differences between learners who primarily utilise technology for passive content consumption and those who use it in innovative, active ways to support their learning. The COVID-19 pandemic has exposed a severe digital divide in South Africa (Khan, 2023; Du Preez and Le Grange, 2020). This is true for the majority of poor countries, as teachers have reported that it has been difficult for them to adjust to a digital method of delivery. This is not because they lack digital literacy, but rather

because they might not have enough access to digital platforms. Although the use of ICT can provide a flexible digital environment, Bawa and Reddy (2020) pointed out that not all subjects unique to schools benefit equally from its use. Data from the DBE shows that just 20% of South African schools had access to the Internet for teaching and learning in 2019 (Du Plessis and Blignaut, 2020).

The state of ICT adoption in South African schools demonstrates that many rural schools are finding it difficult, if not impossible, to implement ICT, leading to the emergence of a digital divide. This is particularly true in cases where some schools (in urban areas) have access to ICT, while others (in rural areas) have very little or none at all (Dansie and Amedzi, 2014). Due to many challenges, ICT adoption in South African rural schools is extremely difficult. It is true that there are difficulties in implementing ICT in schools due to issues with context, technology, and competencies. Research suggests that the failure of schools, teachers, and learners to effectively utilize ICT to enhance teaching and learning can be attributed to the intersections of class, gender, race, or ethnicity (Dlamini, 2022). Beyond the digital divide, concerns regarding access and affordability still need to be addressed to adopt digital education and integrate ICT pedagogically into the classroom (Dhlamini, 2021).

According to Dlamini and Dewa (2021), the way ICT teacher development projects are now implemented appears to perpetuate the binary image of the "haves" and "have-nots." One factor contributing to educational inequalities is the unequal distribution of ICT infrastructure and technological expertise. According to their research, the most crucial elements for successful ICT integration in the classroom are support, professional development opportunities, and equitable access to computing equipment.

There is ample evidence in the literature that, in South Africa, the socioeconomic background of learners and teachers significantly influences their ability to acquire the ICT skills necessary for engagement in the global society. According to Dlamini and Dewa (2021) and Hoadley (2017), teachers in South Africa's quintiles 1, 2, and

3 lack technical literacy and access to communities where ICT is being integrated into the classroom to help them advance their technological pedagogical skills.

An article titled "Meeting the Black Swan: Teacher educators' use of ICT-pre-, during, and eventually post COVID-19 (2021)" explores educators' perspectives on using ICT to help them navigate the pandemic. According to the study, teachers had a rapid learning curve as a result of the pandemic and felt like they were "in a kind of survival phase as teachers." The authors also claimed that because digital learning only harmed certain students who lacked the necessary resources, it widened the digital divide (Curtis, Guberman, Lippeveld, Shapiro, Ulvik, Smith, and Viswarajan, 2021). Additionally, Dlamini and Dewa (2021) reaffirmed the importance of social and cultural capital and emphasized the necessity for teachers to possess a solid basis in general computing. The way that the "haves-have-nots" are currently portrayed is a product of the uneven educational landscape. While schools in the lower quintile continue to be on the edges of ICT implementation, schools in the top quintile appear to enjoy the use of ICT in their classrooms. Dlamini and Dewa (2021) contend that the establishment of an inclusive society is now essential to South Africa's economic growth and educational system.

In light of the digital divide, it is important to remember that high levels of classroom integration do not result from merely offering professional development opportunities to teachers in the area of ICT (Harrell and Bynum, 2018). For ICT to be adopted and have a greater impact on teaching and learning, it is crucial that digital infrastructure and resources be distributed throughout schools (Kempkey, 2016). This highlights the need for the DOE, and the GDE in particular, to address the needs as perceived by the teaching community in order to fulfil its aims and objectives for education (Dhlamini, 2021). When it comes to the integration of ICT in Gauteng, there are significant differences in the availability of digital skills among teachers and the availability of ICT infrastructure in schools. In many cases, schools with access to ICT resources may find that their teachers lack the ICT proficiency necessary to effectively incorporate ICT into their lessons.

Context is crucial when it comes to the digital divide. One should be aware of the potential of various ICTs when used in various contexts for various purposes, as well as the financial and human resource capacities and constraints within the country or locality, as well as the priority education needs (Fang, Canham, Battersby, Sixsmith, Wada and Sixsmith, 2019). While there have been notable successes in other regions of the world, South Africa has a variety of technological knowledge gaps. Understanding the facts of the sociocultural setting of the provinces is, therefore, necessary to achieve ICT integration in the classroom. In order to ensure that teachers have equal access to ICT infrastructure, Dlamini and Dewa (2021) called on national and international organizations to become involved. According to Hart (2023), universal access to and usage of technology are prerequisites for technology's potential to fill the digital divide. In order to give learners the digital skills they need, as well as to increase both the quality and accessibility of education, it is possible to help them become digitally literate.

2.8 Legislative Framework Guiding ICT Usage In Education

Several policies and legislative frameworks have been instituted in South Africa to guide how ICTs are used, implemented and integrated in education. Some of these policies are discussed in this section.

2.8.1 National Education Policy Act (27/1996)

In South Africa, the National Education Policy Act (27 of 1996) establishes the foundation for education. In terms of ICT adoption in education, the Act highlights how crucial it is to include ICT in teaching and learning to raise educational standards and facilitate access to learning resources (RSA, 1996). According to Vandeyar (2013), the Act acknowledges ICT as a useful instrument for increasing educational possibilities and enhancing the effectiveness of education delivery. It offers guidelines for the use of ICT in educational institutions and encourages schools to integrate it into their curricula and instructional strategies (Durodolu and Mojaelo, 2020).

In order to guarantee that teachers have the skills needed to successfully incorporate technology into their lesson plans, the Act additionally highlights the necessity of ICT teacher training (RSA, 1996). It also demands that sufficient ICT infrastructure be provided in schools to facilitate the integration of technology into the classroom. The National Education Policy Act (27/1996) encourages the use of ICT in the classroom as a means to raise standards and prepare learners for life in the digital era.

2.8.2 White paper 7 on e-education (2004)

In South Africa, the Department of Education (2004) published a White Paper on e-education with the goal of establishing a strategic framework for incorporating information and communication technologies (ICT) into the classroom. It acknowledged how ICT may improve educational outcomes and facilitate better teaching and learning. In order to facilitate the efficient use of technology in education, the White Paper highlighted the significance of ICT infrastructure, digital content, teacher preparation, and policy development (Instefjord and Munthe, 2016).

The Department of Education (2004) highlights several important points from the White Paper, such as the necessity of schools having consistent access to electricity, internet, and ICT equipment in order to support e-education initiatives, the creation and distribution of curriculum-aligned, high-quality digital content, teacher preparation, and policy development. A thorough framework for the integration of ICT in South African education was actually offered by the White Paper on e-Education (2004), which emphasized the significance of digital content, infrastructure, teacher preparation, and policy development in order to facilitate the efficient use of technology in teaching and learning (Mofokeng, 2019; Tshimanika, Chigona, and Sadeck, 2022).

2.8.3 National Integrated ICT Policy Green Paper

The National Integrated ICT Policy Green Paper was released in South Africa in 2016 and is a comprehensive document outlining the government's vision and strategic framework for the development and use of information and communication

technologies (ICTs) across various sectors, including education (Department of Communications, 2015). The Green Paper places much emphasis on ICT adoption in education with the goal of using technology to improve learning and teaching. The necessity of providing schools with access to a sufficient ICT infrastructure, including internet connectivity, hardware, and software, is acknowledged in the Green Paper. To facilitate digital learning settings and ensure fair access to educational resources, it highlights the necessity of having a robust infrastructure.

The Green Paper emphasizes the necessity of providing learners and teachers with digital skills to successfully incorporate ICT into the classroom. Programs for improving instructors' ICT for teaching and learning, as well as ensuring that students acquire digital literacy, are included in this. The Green Paper encourages the use of e-learning platforms and tools in order to enhance access to educational resources and facilitate flexible learning opportunities. The creation of virtual classrooms, online courses, and other digital learning tools falls under this category. The Green Paper acknowledges that continued professional development and teacher training are necessary for the successful integration of ICT into education. (Department of Communications, 2015). This includes training on how to incorporate digital tools into the curriculum and use ICT in teaching practices in an efficient manner. In general, South Africa's National Integrated ICT Policy Green Paper offers a comprehensive structure for the integration of ICT into the classroom.

2.8.4 South African Schools Act (SASA) (1996)

One important piece of legislation that regulates the delivery of education in South Africa is the South African Schools Act (SASA) of 1996. The Act offers a legal framework that enables ICT integration, even though it does not explicitly address the use of ICT in education (Soudien, 2018). The SASA sets out the aims and objectives of South African education, which include improving learning outcomes and fostering high-quality education. By strengthening teaching and learning opportunities, expanding access to educational resources, and preparing learners for the digital age, the use of ICT in education can support these objectives.

According to Dowelani and Dowelani (2020), the SASA requires the creation of a national curricular framework that directs the development and implementation of the curriculum. By incorporating ICT-related competences and skills into the curricular framework, the SASA can facilitate the incorporation of ICT into the curriculum. The SASA establishes guidelines for how funds for educational materials and infrastructure development are to be allocated to schools (Mabila, Van Biljon, and Herselman, 2017). To encourage the use of ICT in education, schools can use this money to purchase ICT infrastructure, such as computers, internet access, and software. The SASA provides guidelines for recruiting and training teachers, as well as for their professional growth and qualifying criteria. Teacher training programs can facilitate the adoption of ICT in education by providing educators with the necessary skills and knowledge to effectively incorporate ICT into their teaching methods.

2.8.5 National Development Plan (NDP) Vision 2030

The National Planning Commission (2013) states that the South African government created the National Development Plan (NDP) Vision 2030 as a comprehensive plan to address the social, economic, and political challenges facing the nation and to direct development efforts toward the achievement of particular goals by 2030. ICT is vital to the NDP's economic growth, service delivery, and social development (National Planning Commission, 2013; see also Meladi and Awolusi, 2019).

The NDP places a strong emphasis on the requirement for universal access to high-speed, reasonably priced, and dependable internet service. In order to encourage the use of ICT in education, it is imperative that schools have access to ICT infrastructure, which includes computers, internet connectivity, and digital learning materials. The NDP acknowledges the significance of empowering people with digital skills so they may engage in the digital economy (National Planning Commission, 2013). This entails making sure that students gain the essential digital literacy abilities, as well as training and supporting educators in incorporating ICT into their lesson plans. The NDP understands how critical it is to fund teacher support and training programs in order to give educators the tools they need to successfully

incorporate ICT into their lesson plans. This covers continuing assistance and professional development for educators (National Planning Commission, 2013).

2.8 Theoretical Framework

Many theories and models of technology acceptance and effective usage have been developed in recent decades as a result of the research community's interest in addressing the question of how ICT integration fits into users' personal and professional lives and how they decide whether to accept it or reject it. The Technology Acceptance Model (TAM), developed by Davis in 1989, is one of these theories. In the field of information systems, it is regarded as one of the most widely used and applied models (Dokhny, Darwish, Alyoussef, and Al-Abdullatif, 2021). Derived from the psychology-based theory of reasonable action (TRA) and theory of planned behavior (TPB), TAM has taken a leading role in explaining users' behavior toward technology (Maranguni and Granic, 2015). It is important to also note that the model kept on developing through the years of research and experienced various extensions, reaching the recent TAM 2 model (Maranguni and Granic, 2015). TAM is used as the theoretical basis for this study.

TAM's main goal was to shed light on the mechanisms underlying technology acceptance in order to forecast behaviour and offer a theoretical justification for the successful application of technology (Maranguni and Grani, 2015; Davis, 1989; Davis, 1993). Holden and Karsh (2010) highlighted that the originators of TAM were of the view that the key to increasing the use of technology was first to increase its acceptance, which could be arrived at by asking individuals about their intentions to use technology. Maranguni and Granic (2015) also argue that Davis held the view that the usage of the system is a response that can be explained or predicted by user motivation, which, in turn, is directly influenced by an external stimulus consisting of the actual system's features and capabilities. It is argued that knowing these underlying factors could enable organizations to manipulate these factors to promote acceptance of ICT which would ultimately lead to its use.

Perceived utility (PU) and perceived usability (PU) are considered to be the two primary factors that influence people's adoption of information systems, and these factors are influenced by a variety of external factors (Almaiah and Almulhem, 2018; Grani and Maranguni, 2019). Accordingly, perceived usability and perceived usefulness determine whether or not a person intends to adopt new technology. Davis hypothesized that the attitude of a user toward the system was a major determinant of whether the user would actually use or reject the system. The attitude of the user, in turn, was considered to be influenced by two major beliefs, perceived usefulness and perceived ease of use, with the perceived ease of use having a direct influence on the perceived usefulness. Davis defined perceived usefulness as the degree to which a person believes that using a particular system would enhance their job performance, whereas perceived ease of use was defined as the degree to which a person believes that using the system would be free of effort (Davis, 1987).

Researchers and practitioners have widely accepted the TAM model, which uses perceived usefulness and ease of use to predict and explain learners' intentions for using any e-learning system (Almaiah and Almulhem, 2018). In order to gauge a user's adoption of technology, TAM explores how people engage with their devices (Camilleri and Camilleri, 2017). The practical goal of TAM was to educate practitioners about possible actions they may take before putting systems into place (Kemp, Palmer, and Strelan, 2019). By defining the procedures that mediate the relationship between IS characteristics (external factors) and actual system use, Davis set out to construct the model of technology acceptance (Ibrahim, Leng, Yusoff, Samy, Masrom and Rizman, 2017).

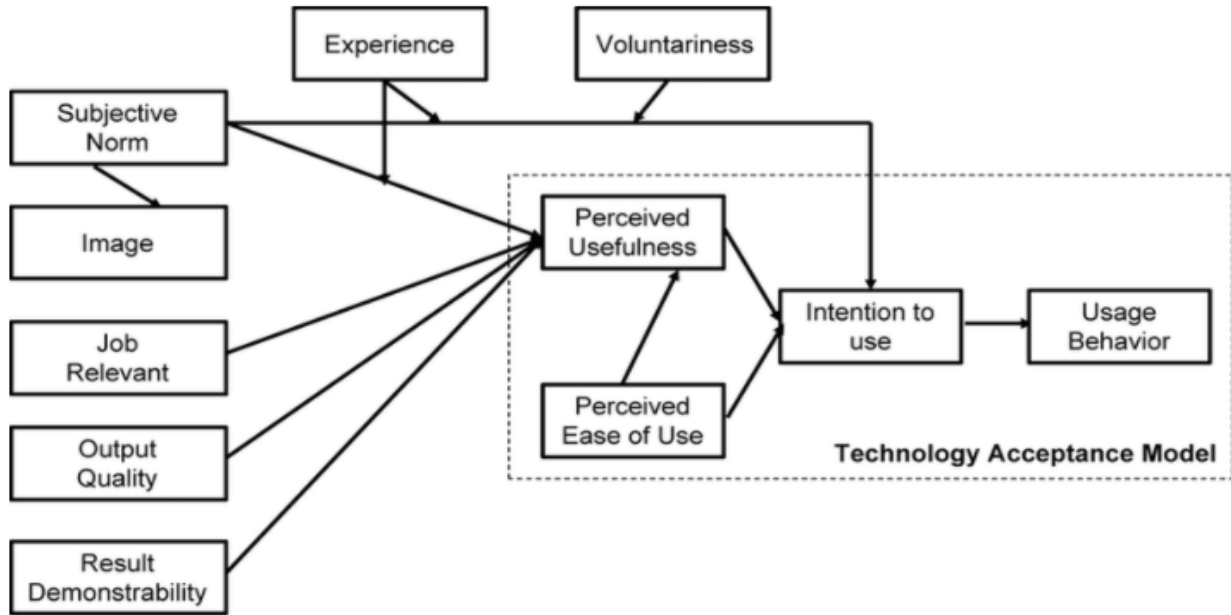


Figure 2.1: TAM 2 (Venkatesh and Davis 2000)

Owing to the continuous findings that the desire to use technology was significantly influenced by perceived usefulness, Venkatesh and Davis (2000) suggested an enhanced model called TAM 2 (Figure 2.1). The goal of TAM 2 was to determine the factors influencing perceived usefulness. Among these variables were the subjective norm, image, job relevance, output quality, and result demonstrability (Venkatesh and Davis, 2000).

Internationally recognized as an essential tool for teaching and learning, ICT is used in higher education. There are many uncertainties regarding how to use it and how powerful it is, despite its worth and success. Additionally, there are inquiries regarding user readiness and awareness of ICT technologies. In order to preserve the long-term viability of education, schools and universities are battling difficulties related to learners' and even teachers' use of ICT in teaching and learning. It is against this background that this study adopts the Technology Acceptance Model as a theoretical framework in which to look at access awareness and the use of ICT to promote efficient teaching and learning at Finetown School in Johannesburg. Table 2.1 below shows the link between the research questions and the model's constructs.

Table 2.1 Mapping Key Questions with the Theoretical Framework

Research Questions	Model Constructs
What is the level of access, awareness, and ICT usage among grade 11 learners?	Perceived Ease of Use (PEOU), Perceived Usefulness (PU)
What are the challenges affecting access, awareness, and use of ICT in promoting efficient teaching and learning among grade 11 learners?	Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Perceived Behavioral Control (PBC)
What measures and strategies are in place to raise access, awareness, and use of ICT to promote efficient teaching and learning among grade 11 learners?	Perceived Behavioral Control (PBC), Facilitating Conditions (FC)
What strategies can be used to improve access, awareness, and use of ICT to promote efficient teaching and learning among grade 11 learners?	Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Attitude towards Using (ATT), Behavioral Intention to Use (BI)

2.10 Summary of the Chapter

This chapter provided a thorough analysis of the literature on ICT in education, with a particular emphasis on South Africa. It started with defining ICT and outlining its evolution. The South African educational system was then discussed with an emphasis on the growing use of ICT in the classroom. It examined how ICT was integrated in South Africa, while also addressing the digital divide and the regulatory framework that governs the use of ICT in the classroom. The chapter concluded with a review of the theoretical framework that underpins the study.

Chapter Three

Research Methodology

3.1 Introduction

This chapter provides a discussion of the research methodology. A research methodology gives a study legitimacy and helps to obtain scientific findings. In other words, research methodology describes the specific procedures or approaches used to find, select, compile, and analyse information on a subject (Thomas, 2021). There are two key questions addressed in this chapter: How was the data gathered or produced? How was it analysed? This research employs a mixed-methods strategy, integrating both quantitative and qualitative approaches to investigate access, awareness, and use of Information and Communication Technology (ICT) among grade 11 learners at Finetown Secondary School in Johannesburg. The integration of both methods promises a comprehensive analysis that not only identifies the challenges hindering efficient teaching and learning but also uncovers existing measures and potential avenues for improving access awareness and ICT utilization, ensuring a more robust framework for promoting effective teaching and learning experiences among grade 11 learners at Finetown Secondary School. The methodology chapter encompasses the study's structure, the rationale for employing a mixed-methods approach, the sampling strategy, data collection procedures to ensure reliability and validity, quantitative and qualitative analysis techniques, the integration of data for comprehensive insights, ethical considerations, limitations, and measures taken to ensure validity and reliability.

3.2 Research Paradigm

This study adopted the pragmatist research paradigm, which is particularly suited to mixed-methods research designs that combine both qualitative and quantitative approaches. Pragmatism emphasizes the practical application of research and the use of methods that best address the research questions at hand, rather than strict adherence to a single philosophical stance (Morgan, 2014). Unlike positivism, which

assumes a single objective reality, pragmatism accepts that reality can be both objective and socially constructed, depending on the context in which it is studied. This paradigm, therefore, provided the flexibility needed to explore the multifaceted constructs of access, awareness, and use of Information and Communication Technology (ICT) among grade 11 learners at Finetown Secondary School.

At the ontological level, pragmatism does not commit exclusively to either realism or relativism but acknowledges that both objective facts and subjective experiences are important in generating knowledge (Biesta, 2010). At the epistemological level, knowledge is seen as provisional and action-oriented, with the goal of producing results that are useful in solving practical problems. For this study, this meant valuing both the measurable dimensions of ICT access and usage, as well as the lived experiences and perceptions of learners and teachers regarding ICT in their school environment.

Methodologically, pragmatism supports the integration of quantitative and qualitative methods. Quantitative data, collected through structured questionnaires, provided numerical insights into the extent of ICT access, awareness, and use. Meanwhile, qualitative data, generated from interviews with teachers, offered a rich contextual understanding of the barriers, challenges, and perceptions. The use of mixed methods under a pragmatist paradigm, therefore, ensured triangulation, increased validity, and provided a more comprehensive picture of ICT integration in the classroom.

The choice of pragmatism was further motivated by the practical orientation of this study. Given the pressing need to address the digital divide and improve ICT integration in South African township schools, a paradigm that focuses on “what works” and generates actionable insights was considered most appropriate (Creswell and Plano Clark, 2018). Therefore, pragmatism enabled this study to bridge the gap between theory and practice by providing context-specific evidence that is both academically rigorous and practically relevant for policymakers, educators, and school managers.

3.3 Research Approach

In this study, a mixed-methods approach was employed, utilising both quantitative and qualitative methods (Pandey and Pandey, 2021). According to Maree et al. (2016), combining qualitative and quantitative research approaches can be advantageous. The benefit of this mixed-methods research design, as adopted in this study, is that it enhances the study's credibility by allowing for some level of generalisation based on quantitative findings (a survey), while also providing an in-depth perspective based on qualitative findings (in-depth interviews and documentary analysis). The researcher was able to simultaneously address confirmatory, exploratory, and explanatory questions by employing the mixed-methods research strategy (Flick, 2020). As a result, the mixed-method research technique has the following benefits for this study: (i) It enables the researcher to gather reliable results, and it produces richer data (Gupta and Gupta, 2022). The utilization of a mixed-method approach in investigating the access, awareness, and use of ICT to enhance teaching and learning among grade 11 learners at Finetown Secondary School holds significant promise in unraveling the complexities inherent in this multifaceted phenomenon.

The decision to employ a mixed-method approach stems from the recognition that access, awareness, and utilization of ICT in the classroom are multifaceted constructs, each influenced by a myriad of factors and dimensions. The qualitative methods, such as interviews and observations, enable researchers to capture the nuanced experiences, perceptions, and contextual intricacies surrounding ICT use among grade 11 learners and teachers. Equally, quantitative methods, including surveys or questionnaires, offer the ability to quantify trends, frequencies, and correlations related to ICT access and usage, providing statistical insights into the prevalence and patterns of technology adoption. Together, these methods complement each other, allowing for triangulation of evidence, validation of findings, and a more holistic interpretation of the complex interplay between access, awareness, and effective utilization of ICT in the teaching and learning process. Moreover, a mixed-method approach enables researchers to overcome the limitations inherent in singular methods. It provides a platform to compensate for the

weaknesses of one approach with the strengths of the other, thereby enhancing the overall robustness and validity of the research findings. Ultimately, this methodological choice enables a more comprehensive and nuanced analysis, contributing to a deeper understanding of how ICT can be optimally integrated into the educational context to benefit grade 11 learners at Finetown Secondary School in Johannesburg.

3.4 Research Design

The study adopted the descriptive research design; this research design aims to describe reality and why things occur the way they do (Lans and Van der Voordt 2002). The study aims to explain the issues of access, awareness and use of ICT to promote efficient teaching and learning. Generally, descriptive research aims to accurately and systematically describe a population, situation or phenomenon, which in this case pertains to ICT access, awareness and usage (Rahi, 2017). It can answer what, where, when and how questions, but not why questions (Patten, 2016). This speaks well to the issues under study, in which the study seeks to investigate what is the level of access, awareness, and ICT usage among grade 11 learners, what are the challenges and what measures and strategies are in place to raise access, awareness, and use of ICT to promote efficient teaching and learning among grade 11 learners?

According to Williams (2007), a descriptive research design can employ a wide range of research methodologies to examine one or more variables. This becomes more ideal in this study investigating access, awareness and use, which is more than one variable. In this study, a mixed-method approach integrating qualitative and quantitative research methods was used. The goal of the quantitative research method is to gather data that can be measured for statistical analysis. The qualitative element just monitors traits rather than using measures or statistics.

3.5 Population and Sampling

Babbie (2010:199) and McMillan and Schumacher (2010: 129) describe the population as a group of elements, cases or individuals that conform to specified

criteria and to which researchers intend to generalise the findings of the research. In selecting the participants for this study conducted at Finetown Secondary School, the target population comprises both grade 11 teachers and learners. The researcher adopted a random sampling procedure to ensure a representative selection of learners for questionnaire distribution. Random sampling is a method that provides each learner an equal chance of being included in the study, thereby enhancing the fairness and impartiality of participant selection. This approach aims to capture diverse perspectives and experiences among grade 11 learners regarding their access, awareness, and utilization of ICT in the classroom.

In parallel, the study involved interviewing key informants specifically, eight grade 11 teachers from Finetown Secondary School who actively integrate ICT in their teaching and learning practices. These key informants are purposefully selected based on their demonstrated use of ICT within their teaching methodologies. The purposive selection ensures that the chosen participants possess first-hand, practical insights and experiences related to the integration of technology in the classroom setting. By focusing on this subset of teachers actively utilizing ICT, the study seeks to capture comprehensive and specialized perspectives on the challenges, strategies, and experiences associated with employing technology for educational purposes within the grade 11 curriculum.

The combination of random sampling for learners and purposive selection for key informant interviews strategically aligns with the study's objectives. It aims to encompass a broad spectrum of grade 11 learners while also homing in on teachers with specific expertise and experiences in ICT integration. This methodological approach ensures a comprehensive understanding of the various facets surrounding access, awareness, challenges, and potential improvements regarding ICT utilization in teaching and learning among grade 11 stakeholders at Finetown Secondary School in Johannesburg.

3.5.1 Sample Size

Sample size refers to the maximum number of respondents that is representative of an entire population. In other words, it is a subset of a population. From the identified accessible population of 354 respondents, a sample size of 178 respondents was determined based on the Krejcie and Morgan Mathematical Table (1970) as cited in Amin (2005). A desired sample size of 178 was chosen due to financial and time constraints that did not allow the researcher to cover the entire population of 354 respondents. To eliminate selection bias, a simple random sampling procedure was used to select the learners.

Table 3.1: Accessible population, Sample size and Sampling Techniques

Category	Accessible Population	Sample Size	Sampling Techniques
Learners	338	170	Random Sampling
Teachers	16	8	Purposive Sampling
TOTAL	354	178	

3.6 Data Collection Instruments

This section presents a discussion of the data collection instruments that were utilized in this study.

3.6.1 Questionnaire

The study used a questionnaire to collect quantitative data on access, awareness and use of ICT to promote efficient teaching and learning in the classroom for grade 11 learners at Finetown Secondary School in Johannesburg. A questionnaire is a structured data collection instrument that consists of a set of predetermined questions presented in a written format. It is a widely-used tool in research as it allows for the efficient collection of quantitative data from a large number of respondents. According to Maree (2016), questionnaires have several benefits, such as giving respondents time to consider their responses and being able to distribute

them to a sizable number of respondents. In the context of studying the access, awareness, and use of ICT in promoting teaching and learning, a questionnaire was used to gather information about the students' access to technology, their level of ICT skills, their attitudes towards using technology in the classroom, and their perceived benefits and challenges of ICT integration. The questionnaire was administered in a paper format.

3.6.2 Observation

Observational methods serve as a powerful tool within this study's context, offering an unfiltered and real-time glimpse into the dynamics of ICT utilization within the grade 11 classroom at Finetown Secondary School. By directly observing the behaviours, interactions, and activities of both learners and teachers during ICT-based lessons, the researcher gains an unparalleled vantage point to assess and understand the practical implications of technology integration.

Observation affords the opportunity to evaluate the tangible application of ICT tools and resources in the educational setting. It enables the researcher to assess the level of engagement among grade 11 learners, determine the extent to which technology is integrated into the teaching process, and evaluate the overall quality of ICT use. This firsthand observation of classroom dynamics offers nuanced insights into how technology influences the teaching and learning processes, shedding light on its effectiveness, challenges, and overall impact on educational outcomes.

Moreover, through observation, the researcher can identify any barriers, challenges, or obstacles encountered by both teachers and learners while integrating ICT into the classroom. Whether it's technical issues, pedagogical challenges, or socio-cultural factors affecting ICT utilization, direct observation enables the documentation and analysis of these challenges in their natural context. This contextual understanding forms the basis for identifying areas for improvement and devising targeted strategies to enhance the integration of technology for more efficient teaching and learning experiences.

The richness of observational data lies in its contextual and holistic nature. By immersing in the classroom environment, the researcher can capture the intricacies of ICT utilization that might not be fully articulated through surveys or interviews alone. This methodological approach not only validates findings from other data collection methods but also offers a comprehensive understanding of the practical realities and complexities involved in leveraging ICT for educational purposes among grade 11 learners at Finetown Secondary School.

3.6.3 Interviews

Data for the qualitative part of this study were collected through in-depth interviews. This type of interview enabled the researcher to record qualitative data, thereby increasing accuracy and maximising verifiability and an audit trail (Naz and Aslam, 2022). Interviews involve a face-to-face or virtual conversation between the researcher and the participant(s) to gather in-depth qualitative data. In the context of this study, interviews were held with grade 11 teachers and the school head. This enabled a more in-depth examination of the participants' experiences, perceptions, and motivations regarding the use of ICT in the classroom. The researcher asked open-ended questions and probed for more detailed responses. In this way, interviews provided valuable insights into the participants' thoughts, emotions, and behaviours related to ICT use, allowing for a more nuanced understanding of the topic. During the interviews, the researcher recorded the conversations with the participants using recording devices. This was done to ensure that everything said in the interview was accurately captured. Additionally, it made it easier for the researcher to analyze and replay the interview to identify important details that would have been overlooked during the conducting of the interview. During the collection of data, the researcher was taking notes.

3.7 Reliability and Validity

There are several reliability indicators that were observed. Standard guidelines for the use of data collection tools are among them. Each respondent would also get a standard cover letter outlining the study and providing an introduction. To facilitate

analysis, responses were coded and entered into spreadsheets. Prior to the larger research, a pilot study was carried out to evaluate the methodology, sample, instruments, and analysis. In the view of Bless et al., (2013), it establishes the suitability of language, the respondents' reading levels, and their comprehension of the questions on the data collection instruments.

How the study measures what it promises to measure is what is referred to as validity in research (Maree, 2016). Schutt (2018) states that internal validity is the degree to which uncontrollable external variables that could distort the results are taken into account. In this study, the threats to internal validity were guarded against, including those posed by history, pretesting, instrumentation, subject attrition, maturation, and dissemination. The results of the questionnaire were checked for good internal validity using factor analysis to ascertain construct validity. However, for the qualitative data, the focus was on trustworthiness, depth, rigour and data saturation. Data saturation was reached, and there was no need to conduct further interviews.

3.7.1 Data Analysis

Qualitative data, primarily gathered through interviews, went through a meticulous transcription, ensuring completeness, consistency, and the preservation of the interviewees' own words. The qualitative analysis adopted thematic analysis as the primary method. This approach involves a systematic search for recurring patterns and themes across the entire qualitative dataset.

The thematic analysis process begins with the identification of open codes, which essentially involves giving descriptive labels to text passages based on their content or meaning. These codes are then grouped into related categories, and further inferential or pattern codes are applied. This iterative process enables the researcher to organize and categorize data segments into coherent themes and categories. Continuous comparison of data segments ensures that they are appropriately placed within these categories and themes, enhancing the reliability and validity of the qualitative analysis, as outlined by Maree et al. (2016). Interviews conducted were eight. Thematic saturation was reached after the sixth interview as no new codes or

themes emerged in the final two interviews. This decision is consistent with the principle of data adequacy in qualitative research (Guest, Bunce and Johnson, 2006).

On the other hand, the quantitative data collected, likely from surveys or questionnaires distributed among grade 11 learners, were subjected to descriptive statistical analysis. This involved summarizing and presenting the data points using numerical summaries and measures to provide an overview of the dataset's characteristics. To conduct the quantitative analysis, the Statistical Package for the Social Sciences (SPSS) software were utilized. This software facilitates the entry, organization, and statistical analysis of quantitative data, allowing for various statistical tests and computations as outlined by Abu-Bader (2021). By employing SPSS, the researcher gains the ability to perform a range of analyses, including measures of central tendency, dispersion, correlations, and potentially inferential statistics, depending on the research questions and data distribution.

3.8 Summary of the Chapter

The chapter has detailed the research methodology used to investigate access, awareness, and use of ICT among grade 11 learners at Finetown Secondary, employing a mixed-methods approach within a positivist paradigm. The study utilized a descriptive research design to systematically describe ICT-related phenomena. Data was collected from 170 randomly sampled learners through questionnaires and from eight purposively selected teachers via in-depth interviews. Quantitative data were analyzed using descriptive statistics in SPSS software, while qualitative data underwent thematic analysis to identify recurring patterns and themes. Reliability and validity were ensured through standardized procedures, a pilot study, factor analysis for quantitative data, and data saturation for qualitative findings, addressing ethical considerations and limitations to provide a comprehensive understanding of ICT integration in education.

Chapter Four

Data Presentation and Analysis

4.1 Introduction

The previous chapter provided a discussion of the methodology used in this study. This chapter presents research findings that were collected using both quantitative and qualitative research instruments. The quantitative aspect of the study focused on exploring and investigating the experiences and perceptions of ICT access, awareness and usage. This included the frequency of ICT use, self-rated ICT skills, and the challenges faced in accessing and utilising technology in teaching and learning. Quantitative data was collected from learners. On the other hand, the qualitative data collected from teachers pertained to the perspectives on ICT integration training and its impact on promoting efficient teaching and learning. This chapter starts by presenting data collected from quantitative methods, followed by a discussion of data collected through interviews.

4.2 Demographic Profile of Participants

This section provides a presentation of the demographic profile of participants. It begins by describing gender distribution, followed by age range, family income levels and parents' education level. This demographic information is important because it provides an understanding and insights into how these can influence the use of ICT in teaching and learning, as well as challenges faced by both learners and Teachers in integrating technology in learning and teaching processes.

4.2.1 Gender Distribution

The pie chart below illustrates the gender distribution of participants in the study. The study included a total of 170 learners at Finetown Secondary School, with the gender distribution summarized below.

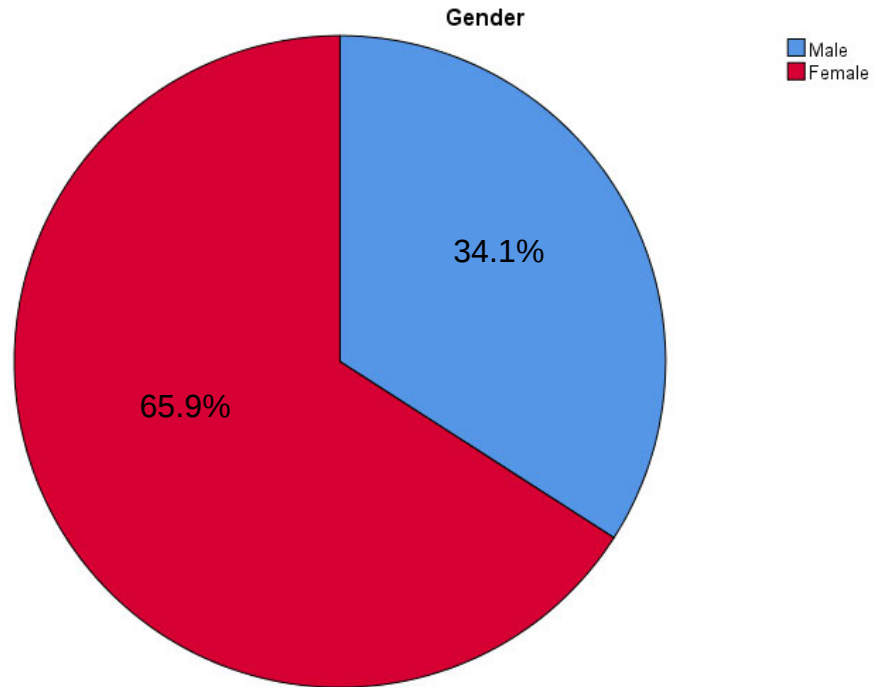


Figure 4.1: Gender of Learners

From the data collected, the majority of learners who participated in the study were males, representing 65.9% (112 learners) while females comprised 34.1% (58 learners). This gender distribution shows a slightly higher representation of male participants in the study. This aligns with the demographic structure of Finetown Secondary School. However, the difference is not large enough to reflect gender bias in the sampling process used in this study. This imbalance suggests that males were more willing to participate in this study than female learners.

4.2.2 Age Range

The study surveyed 178 learners, and the age distribution of participants is illustrated Table 4.1. The data reveal that the majority of learners were 18 years old, comprising 39.8% (approximately 68 learners) of the sample. This was followed by 17-year-olds, who represented 28.4% (approximately 48 learners). Learners aged 19 accounted for 18.1% (31 learners), while those aged 16 comprised 10.3% (18 learners). Smaller proportions were observed for learners aged 20 (2.9%, 5 learners), 21 (0.6%, 1 learner), and 22 years (0.6%, 1 learner), likely representing data entry anomalies or

outliers. Overall, the findings indicate that the majority of grade 11 learners at Finetown Secondary School fall within the expected age range for their grade level, with a small number of outliers.

Table 4.1: Age Distribution of Learners

Age	Frequency	Percent
22	1	0.6
16	18	10.2
17	50	28.4
18	70	39.8
19	33	18.8
20	3	1.7
21	1	.6

This age distribution of sample learners aligns with the demographic structure of learners at the school under study, where the majority of grade 11 learners are adolescents. This age distribution analysis is important in terms of understanding the population dynamics to ensure that the findings of the study are representative of the diverse age groups that constitute grade 11 learners at Finetown Secondary School. The findings by Aydin (2018) revealed that there are no substantial differences between age and attitudes towards ICT.

4.2.3 Family Income Levels

The pie chart below illustrates the data for the family income levels of participants. From Figure 4.3, it is clear that the income distribution is categorized as Below R5,000, R5,001–R10,000 and Above R10,000, respondents were requested to indicate their family income levels. Responses to the family's monthly income show that the 64.8% of participants (110 learners) came from families that earn less than 5000 Rand per month. This translates to a large portion of grade 11 learners at Finetown Secondary School. This, in turn, has a significant impact on their access to

and use of ICT in their learning processes. Data gathered reveal only a smaller proportion of learners from families that earn higher incomes.

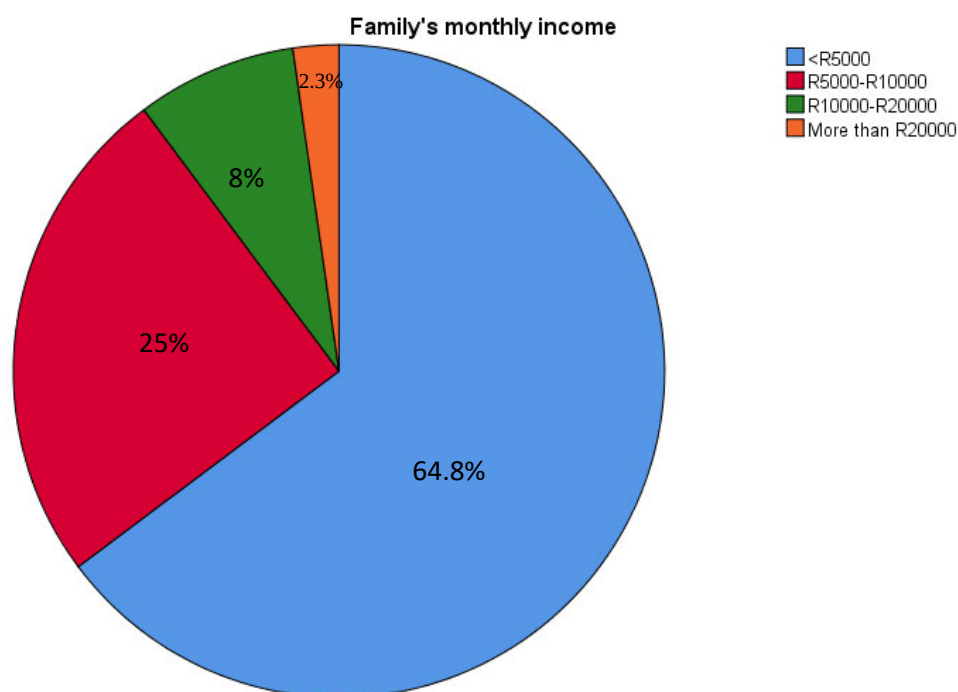


Figure 2.2: Family's Monthly Income

The responses to the questionnaire show that several learners at Finetown Secondary School come from families and households with low-income levels. The low-income levels of households have the potential to impact how learners access ICT tools at home. Likewise, the financial disparities reflected in the data widen the digital divide at Finetown Secondary School. These findings resonate with broader discussions in educational and technology research concerning the effect of socio-economic factors on access to ICT. Learners who come from high-income families are more likely to have one or more devices, whereas those from low-income families are likely to face challenges in owning ICT (van Deursen and van Dijk, 2018; Tsetsi and Rains, 2017). TAM further supports this as it emphasizes that perceived ease of use and perceived usefulness are heavily influenced by factors such as family income, which can affect the ability of learners to engage with ICT tools both at

school and at home. Understanding these factors is very important in developing strategies tailored to address and improve ICT access and usage at the school under study.

4.2.4 Parents'/Guardians' Education Level

The questionnaire requested respondents to indicate their parents' or guardians' education level. This is reflected in Figure 4.3. The questionnaire grouped educational levels into four categories: No Formal Education, Primary Education, Secondary Education, and Tertiary Education.

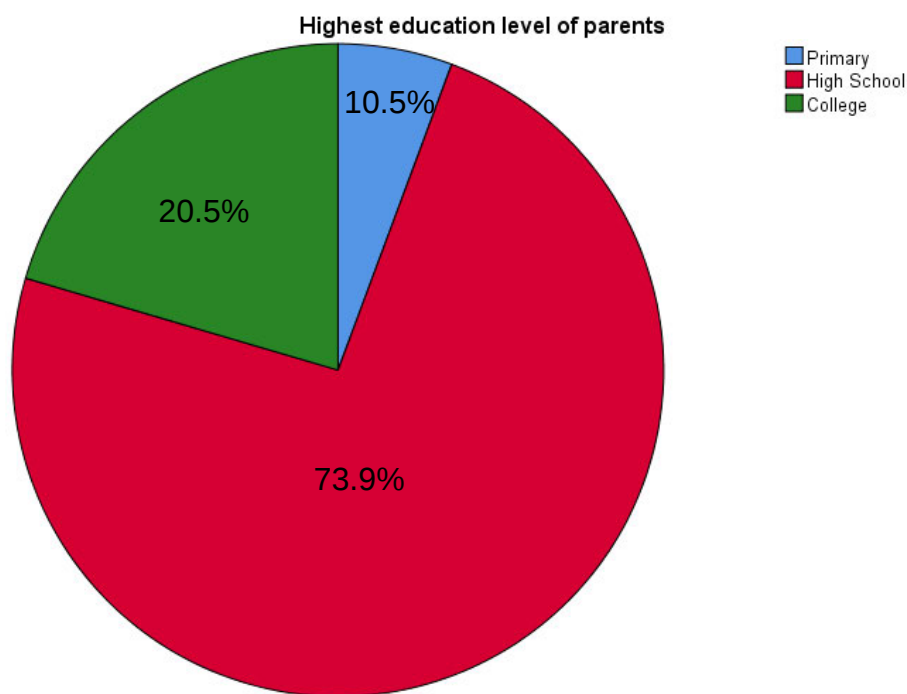


Figure 4.3: Parents' Level Of Education

As indicated in Figure 4.3, the majority of learners who participated in the study reported that their parents' highest education level is high school, with a response rate of 73.9% (126 learners). Meanwhile, 20.5% of the respondents (35 learners) indicated that their parents had attained a college-level education. Learners who indicated that their parents only completed primary education constituted only 5.7%. (10 learners). This discrepancy in parental education levels mirrors an important

issue contributing to the digital divide at Finetown Secondary School. Regarding the TAM theory, the perceived ease of use and perceived usefulness are influenced by the support that learners obtain from their families. Thus, low levels of parental education may hinder the ability of parents and guardians to support these learners in accessing and utilizing ICT resources successfully at home. Parents and guardians with higher education levels are likely to value and encourage the integration of technology in the education of their children, unlike parents with limited parental education.

4.2.5 Profile of Interview Participants

In-depth interviews were conducted with eight (8) teachers from Finetown Secondary School. To ensure confidentiality, each participant is referred to by a code (T1 to T8). Table 4.2 provides a demographic profile of the participants. The group consisted of five female and three male teachers, offering a gender-balanced perspective. Their teaching experience at Finetown Secondary School ranged from 2 to 9 years, with an average of approximately 5 years. This variation in experience is significant as it means the participants could provide insights into the evolution of ICT access and use at the school over a considerable period, from relatively new staff to those with long-standing tenure. The diversity of the sample strengthens the trustworthiness of the qualitative findings, as it captures a wide range of experiences within the school environment. The interviews lasted approximately 20-30 minutes each and continued until data saturation was reached after the seventh interview, with the eighth interview confirming the established themes.

Table 4.2 Demographic Profile Of The Participants.

Participant Code	Gender	Years Teaching at Finetown
T1	Female	9
T2	Male	6
T3	Female	4
T4	Female	2
T5	Male	4
T6	Female	3
T7	Male	7
T8	Male	5

4.3 Access to ICT Devices

The section presents the state of access to ICT devices at Finetwon Secondary School in line with the objectives and research questions of the study.

4.3.1 Personal ICT Device Availability

From the data collected, it was evident that the majority of learners at this school had access to personal ICT devices at home. This had a response of 72.7% (124 learners), while 27.3% (46 learners) of the responses showed that they did not have access to such devices. This data is a clear indication that the majority of grade 11 learners at Finetown Secondary School are equipped with the means to use ICT for their learning purposes in a home environment, and this can greatly improve their learning opportunities. Having access to such devices is important because ICT devices can facilitate learning and provide the means to access a range of educational resources online, helping to undertake schoolwork, especially in subjects that require digital tools.

These findings align with those of Haleem et al. (2022), who highlighted how digital technologies have transformed the entire education system and made life easier for learners. Additionally, the insights from TAM highlight the role played by the perceived ease of use and perceived usefulness in shaping how learners adopt technology. In the context of this study, learners with access to ICT devices are likely to find digital tools useful and easy to use, and this encourages greater engagement in technology-based learning.

However, it is also important to note that 27.3% (46 learners) who indicated a lack of such access are at a clear disadvantage as they may struggle to keep up and undertake assignments that require the use of ICT tools and applications. This will affect how they develop digital skills and also face challenges in accessing educational and learning materials online. Lamb et al. (2020) demonstrated this when they examined the impact of online learning on disadvantaged children. This study is in sync with their findings. These findings underscore that a digital divide exists within the school, which can only be addressed through targeted interventions crucial for fostering equal opportunities for all learners at Finetown School to benefit from technology-based education.

4.3.2 Frequency of ICT Device Use Outside School

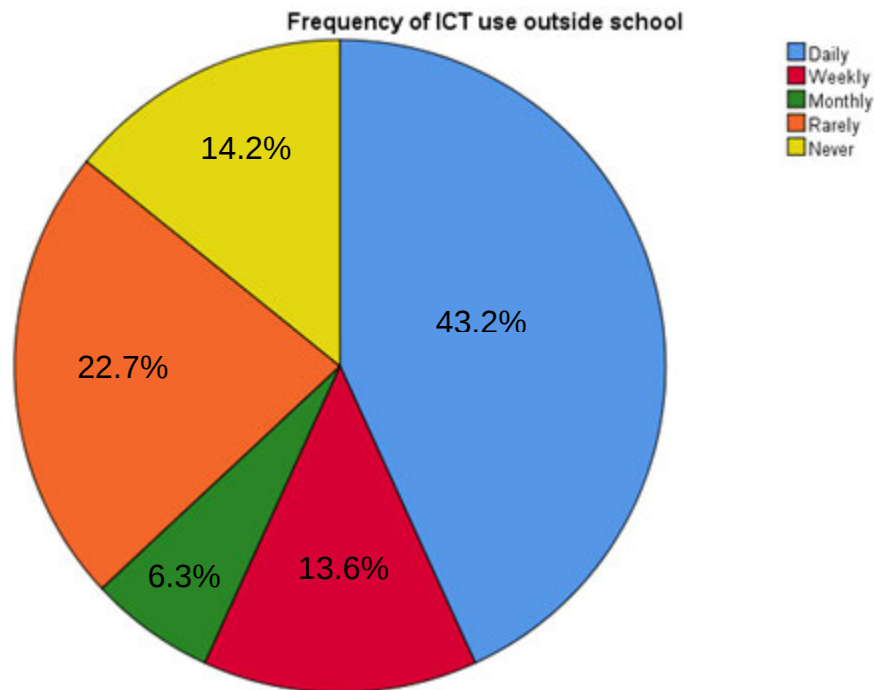


Figure 4.4: Frequency of ICT Use Outside School

Learners were also requested to indicate the frequency with which they use ICT outside school. The responses, as shown in Figure 4.4, show varying frequencies. A significant proportion of learners reported using ICT daily, with a response rate of 43.2% (73 learners). Although there were no specific details regarding whether they are using these tools for learning purposes, their interaction with digital tools might contribute to the development of digital literacy and the integration of ICT technologies into their learning processes (Reddy, Sharma, and Chaudhary, 2020). The data also shows that their daily usage demonstrates a high level of familiarity with ICT tools among grade 11 learners, which impacts their academic performance and digital literacy. TAM further provide insights into these findings. TAM highlights that perceived ease of use and perceived usefulness are key factors influencing how learners adopt and integrate ICT tools into their learning (Ibrahim and Shiring, 2022). The theory purports that learners with regular access to ICT tools outside the school environment are more likely to perceive digital tools as useful and easy to use, thus encouraging higher levels of engagement with them.

When asked about the level of ICT engagement, 13% of the respondents (22 learners) indicated that they use ICT weekly, suggesting a moderate familiarity with ICT tools, while about 6.3% of the respondents (11 learners) indicated that they use it monthly, indicating limited engagement with ICT technologies outside the school. However, 22.7% of the respondents (46 learners) indicated minimal ICT usage, with 14.2% (24 learners) indicating that they never used ICT outside School. While a greater population of learners) In grade 11, shows regular engagement with ICT tools outside the school, a sizeable number of grade 11 learners at Finetown Secondary School face challenges that limit them from fully benefiting from ICT-based learning. These findings resonate with the study by Chisango and Marongwe (2021), who reported that learners from disadvantaged secondary schools in Africa are affected by the digital divide in terms of their utilization of ICT. Likewise, these findings are corroborated by TAM, which underscores that learners with inadequate access experience reduced perceived usefulness, affecting their acceptance and use of ICT tools. These barriers include limited connectivity, a lack of devices, and a lack of digital Skills. This data highlights the need to address these disparities to ensure that all learners have access to ICT resources.

4.3.3 ICT device availability at school

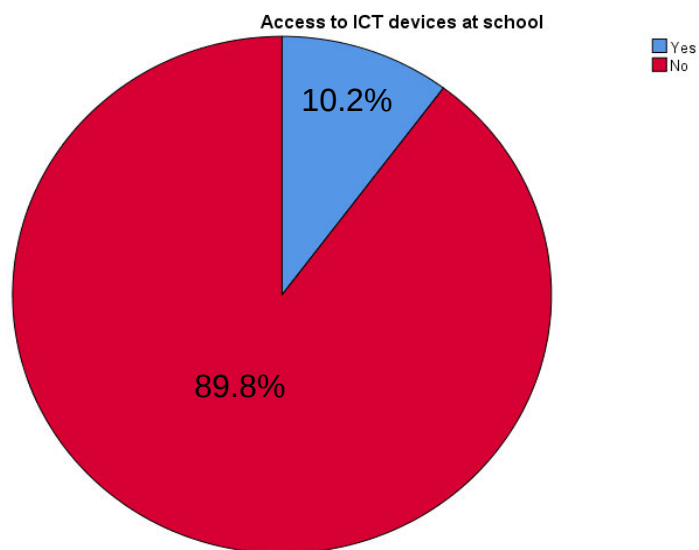


Figure 4.5: Access to an ICT Device at School

The questionnaires distributed to learners also requested that they indicate how they access ICT devices at school; the responses revealed a significant gap. In terms of how learners access ICT devices, Figure 4.5 shows that only 10.2% of learners (17) indicated that they have access to ICT devices at school, while 89.8% of them (153 learners) indicated that they do not have access to ICT tools at school. The significant percentage of learners who indicated they do not have access to ICT technologies is concerning because it affects the opportunities that learners have to engage with ICT in a supportive and structured learning environment. This finding also finds expression in Mhlongo et al., (2023) who demonstrated the challenges that are encountered in adopting and using smart digital technologies in learning environments. Thus, with several learners lacking access to ICT devices at Finetown Secondary School, they are forced to rely on external access to develop digital skills and complete assignments that require the use of technology. This lack of access leads to disparities in learning outcomes and experiences, especially for learners who do not have access to ICT devices at home (Rasoo and Naidoo, 2024). TAM underscores that learners with limited access to ICT at school are likely to perceive the usefulness as low and struggle with ease of use. As a result, this will hinder their ability to adopt technology effectively for learning purposes. Therefore, addressing issues by providing ICT infrastructure at schools is vital in promoting equitable access and ensuring that learners participate in digital-based learning.

The issues raised by learners pertaining to access were corroborated by teachers during the interviews. They revealed that learners at Finetown Secondary School have limited access to ICT devices in their learning. This was reported as a significant barrier to the integration of ICT in teaching and learning. The teachers lamented that this lack of access limits learners' ability to engage with digital learning materials, which in turn affects the development of their critical ICT skills. T3 in grade 11 said:

"Our learners do not have access to any ICT device here at school, and most of them can't even use computers or tablets in the classroom. I feel like they

are missing out because the world is moving towards a digital era where learning is digitalized. But here it seems we are still stuck in the past.”

These sentiments were corroborated by T5 who also added:

“It is disappointing that we only hear about the fantastic ways ICT is enhancing learning, but none of those are applicable here, because our learners do not even have basic access to devices like laptops and tablets, and it is hard to teach digital literacy when they have never even touched a computer.”

These insights from the interviews with teachers highlight the need for interventions aimed at improving and enhancing access to ICT resources in Finetown Secondary School, as well as enhancing teacher and learner training so that there is effective use of digital technologies in teaching and learning processes. This is critical because, without these foundational steps, the full benefits of ICT integration in education will remain unattainable at Finetown Secondary School.

4.3.4 Frequency of ICT device use in the classroom

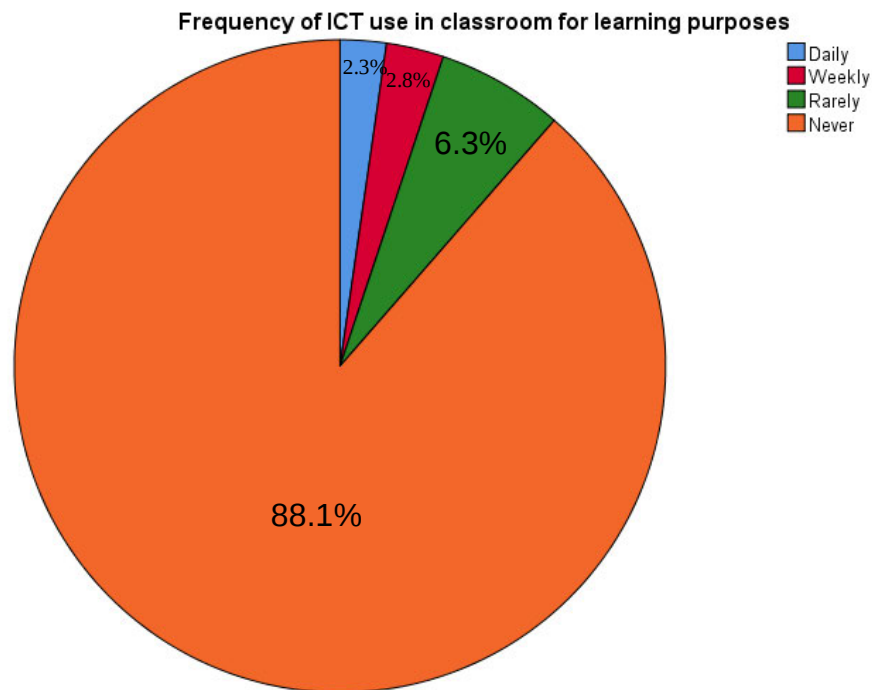


Figure 4.6: Frequency of ICT use in the Classroom for Learning Purposes

When learners were asked to indicate how frequently they used ICT devices in the classroom for learning purposes, 88.6% of the respondents (151 learners) reported that they never used ICT devices in the classroom for their learning purposes. Only 2.3% of the respondents (4 learners) indicate that they use ICT daily, with 2.9% (5 learners) indicating that they use it occasionally. This is shown in Figure 4.6. From the interviews conducted with the teachers, it was discovered that ICT usage in teaching at Finetown Secondary School is infrequent, as teachers rely heavily on traditional methods, such as textbooks and photocopies, for delivering their lessons. This was despite the fact that they recognised the potential of ICT in enhancing teaching and learning. However, the lack of reliable and supportive infrastructure, limited training, and other challenges affected the integration of ICT tools in teaching and learning, limiting their use to administrative purposes and lesson preparation only.

This was expressed by T2, who said,

“I rarely used ICT in my teaching because of limited resources. We do not have projectors or smart boards, and the internet connection is very poor here. Most of the time, I just use textbooks and photocopies for my lessons.”

T5 also remarked that

“We mainly use ICT in the preparation of our lessons for things like typing our notes and creating our own PowerPoint presentations. But when it comes to actual teaching in the classroom, we rely much on paper and books. There is not much opportunity to use ICT in the classroom itself.”

Therefore, while the teachers interviewed acknowledged the availability of lectures for teachers, these devices are primarily used for lesson preparation, rather than as teaching tools in the classroom. Thus, at Finetown Secondary School, ICT is seen as a supplementary resource for lesson preparation rather than as a means for engaging students and learners in the learning process. Therefore, the limited use of ICT in actual teaching and learning poses a challenge to promoting efficient and interactive education in schools. This data indicates that ICT is not integrated into classroom activities at this school, suggesting that technology is not being used to enhance teaching and learning processes. This is attributed to factors such as insufficient infrastructure, lack of teacher training and institutional support, which is further discussed in other sections of this Chapter. Graham, Stols, and Kapp (2020) mentioned similar challenges when examining the reasons why South African teachers are not utilising ICTs in classrooms. Given TAM, where infrastructure is insufficient, and teacher training is inadequate, the perceived ease of use and usefulness of ICT tools are reduced, thereby diminishing their adoption (Kundu and Bej, 2021). Consequently, this minimal utilization of ICT technologies in teaching and learning reflects the need to develop interventions tailored towards integrating ICT in teaching and learning.

4.3.5 Satisfaction with the current use of ICT in education

When the learners were asked to indicate how satisfied they were with the current use of ICT in their learning processes, the responses showed mixed results in terms of student satisfaction. About 71.6% (122 learners) expressed dissatisfaction with the current state of ICT utilization for education or, rather, learning purposes. In contrast, only 9.1% of the respondents (15 learners) indicated that they were very satisfied. Additionally, other learners indicated that they were somewhat satisfied, and over 7% (12 learners) remained neutral about their satisfaction levels. This data indicates that learners at this school are largely dissatisfied with how ICT technologies are being utilized in their learning activities to promote efficient teaching and learning. Insights from TAM help to contextualize these findings. TAM proposes that user satisfaction is affected by the perceived ease of use and perceived usefulness of ICT (Isaac et al., 2018). Thus, learners who view ICT as challenging or irrelevant are less likely to experience satisfaction with it. The findings underscore the need for improving ICT integration to ensure that it promotes the learning experience effectively.

4.4 ICT Skills and Training

This section presents data related to how learners rate their digital skills, their self-assessed ICT skills levels, and their perception of the quality of training they receive at Finetown Secondary School.

4.4.1 Self-assessed ICT skill levels

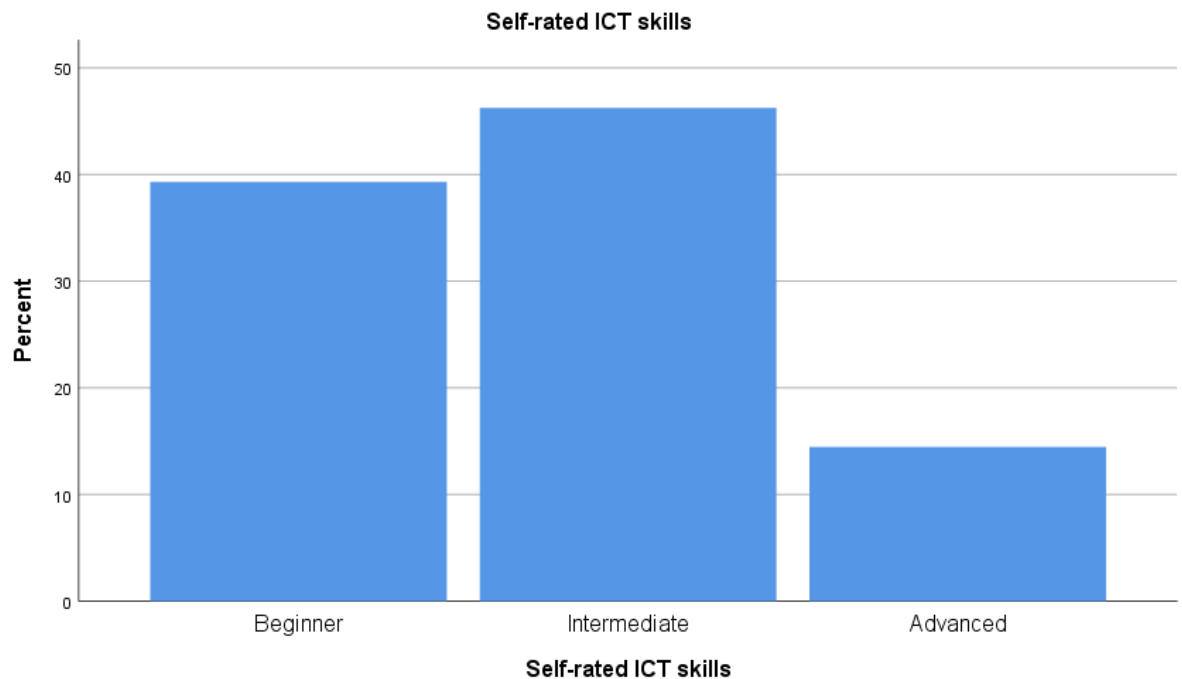


Figure 4.7: Self-rating ICT Skills

The questionnaire data revealed gaps in the ICT skills and training of learners at Finetown Secondary School. The learners were requested to self-rate their ICT skills as shown in Figure 4.7. 46.2% of the respondents (78 learners) indicated that they possess intermediate skills, underscoring their moderate level of familiarity and experience with digital tools. Likewise, 67 learners (39.3%) indicated themselves as beginners, indicating that they had limited proficiency and confidence in utilizing ICT tools. Only 14.5% (25 learners) rated themselves as advanced users, indicating that only a small group of grade 11 learners had high-level ICT competence. The study also established that, despite discrepancies in self-rated skills, the training available at the school is very limited. This was evidenced by 98.3% of learners (167) who indicated that they had not received any training at the school. Only 1.7% of the respondents (3 learners) indicated that they had received some form of informal training. The data indicate that 169 learners (99.4%) had not received any structured or formal ICT training or education. There is no doubt that the lack of formal training at Finetown Secondary School severely affects learners' opportunities to utilise ICT

technologies in their learning and to develop the digital skills necessary for their learning experiences. This resonates with Graham, Stols, and Kapp (2020), who noted similar concerns in a study on why South African teachers are or aren't using ICT in their classrooms. The significant number of learners identifying as beginners further emphasizes the urgent need for the school to implement structured ICT training programs. These should aim to provide foundational skills for novices, offer advanced learning opportunities for proficient users, and integrate ICT into the broader curriculum to enhance practical application. Addressing these gaps is essential to equip learners with the technological competencies necessary to thrive in a digitally driven world.

4.4.2 Quality of ICT Training



Figure 4.8: Quality of ICT Training

The data on the quality of ICT training received by learners at Finetown Secondary School, shown in Figure 4.8, indicates that only 0.6% (1 learner) reported receiving

ICT training, specifically in basic skills. This number highlights the limited access to ICT education within the school, as 169 learners (99.4%) reported having received no training at all. Mwapwele et al (2019) noticed similar challenges when investigating ICT adoption in South African rural schools. When assessing the quality of ICT training received, perceptions were predominantly negative. Nearly 81 learners (47.7%) regarded the quality of training as poor, while 22.2% (38 learners) considered it average. About 17.0% (30 learners) rated it as good, and only 5.7% (10 learners) labelled it as excellent. These responses indicate that even when training is provided, it is often inadequate or fails to meet the learners' expectations.

The minimal provision of basic ICT training, combined with learners' largely negative assessment of its quality, highlights critical shortcomings in the school's efforts to promote digital literacy. It is for this reason that Mukhari (2016) argues for the need to develop robust ICT training programs that go beyond basic skills, ensuring comprehensive and high-quality instruction.

4.4.4 Adequacy of ICT training in preparing students

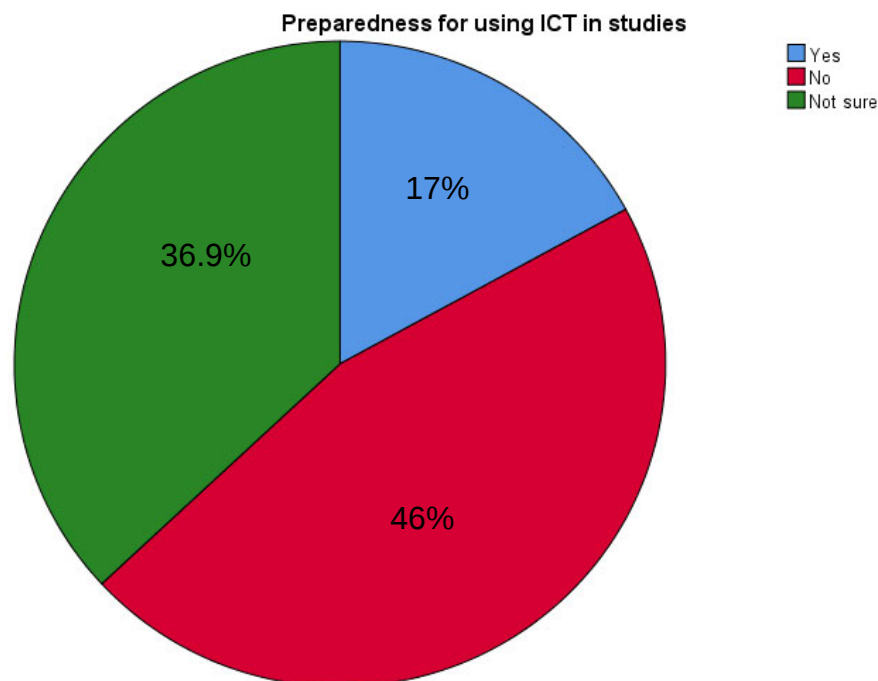


Figure 4.93: Preparedness for Using ICT in Studies

Data on learners' preparedness for using ICT in their studies at Finetown Secondary School (Figure 4.9) shows a mixed response. Only 17.0% of the respondents (29 learners) feel adequately prepared to use ICT for their studies. Meanwhile, 78 learners (46%) indicate that they are not prepared, and 36.9% (63 learners) are unsure about their readiness to engage with technology for academic purposes. This discrepancy suggests a significant challenge in equipping learners with the necessary ICT skills to support effective learning. Research by Daggubati and Ramakrishnan (2018) highlights the importance of training in enhancing learners' technological proficiency. Furthermore, UNESCO (2019) emphasizes that providing continuous professional development for learners is essential for fostering a digital learning environment. However, a low preparedness rate, combined with a considerable number of learners expressing uncertainty, underscores the vital need for targeted ICT training and support.

4.4.5 Perceptions of Teachers Concerning Training on ICT Usage

The findings of this study also indicated that training sessions with teachers are irregular and insufficient in frequency. It was noted from the interviews that although training was provided, it was not frequent or regular enough to equip teachers with the skills and confidence that they need to effectively integrate ICT into their teaching. Teachers interviewed expressed frustration with the lack of professional development opportunities related to ICT usage. It was revealed that insufficient training has created a knowledge gap, leaving many teachers unsure of how to use ICT technologies to enhance the teaching and learning experience in classrooms. T8, who was interviewed, remarked that:

“We have had a few sessions on ICT, but they are not provided on a frequent basis, and these training sessions are not enough to make a real impact.”

This lack of training and ICT skills is a concern, given that Van Dijk (2008) argued that skills are an essential condition for competent ICT integration. The teachers at Finetown School lacked the digital competencies regarded by UNESCO (2011) as

essential, as they were not trained on how to use technology in the classroom. T3 voiced similar concerns, stating:

“The training we received was basic, and it was only one or two sessions and was not spread over long periods. We need continuous training, not just once-off events”.

These findings are also in line with those of Marongwe et al. (2019), who suggest that teachers require more training and that one-size-fits-all training should be avoided. Likewise, from the interviews, it was clear that the training sessions did not emphasize the practical aspect of ICT integration into teaching and learning practices. It focused on administrative tasks rather than leveraging technology to enhance learning in classrooms. The study revealed a lack of focus on ICT integration into pedagogical strategies, which created a situation where the limited application of technology in learning processes. T5 interviewed highlighted that.

“We only received training that covered how to use basic software like Microsoft Word and administrative tasks, but no one has shown us how to use ICT and make our learning more interactive and engaging”.

The same sentiments were shared by T6, who stated that:

“The training we received did not adequately prepare us to utilise ICT in our teaching and learning environments. It is one thing to know how to open a laptop and or use a project, but it is another thing to know how to apply these tools in teaching and learning.”

As a result, it was indicated that teachers are relying on outdated teaching methods, such as the use of textbooks and chalkboards to deliver their lessons, despite the potential of ICT to promote efficient teaching and learning. Bengali et al. (2018) have observed that some teachers are not yet "good enough at the kind of pedagogies that make the most of technology. UNESCO (2011) has long noted that the creation of ICT knowledge and its deepening must occur for an individual to use ICT, including the skills needed for meaningful technology literacy.

4.5 Challenges in Accessing and Using ICT

This section addresses challenges in accessing and using ICT devices

4.5.1 Challenges in Accessing ICT devices at School

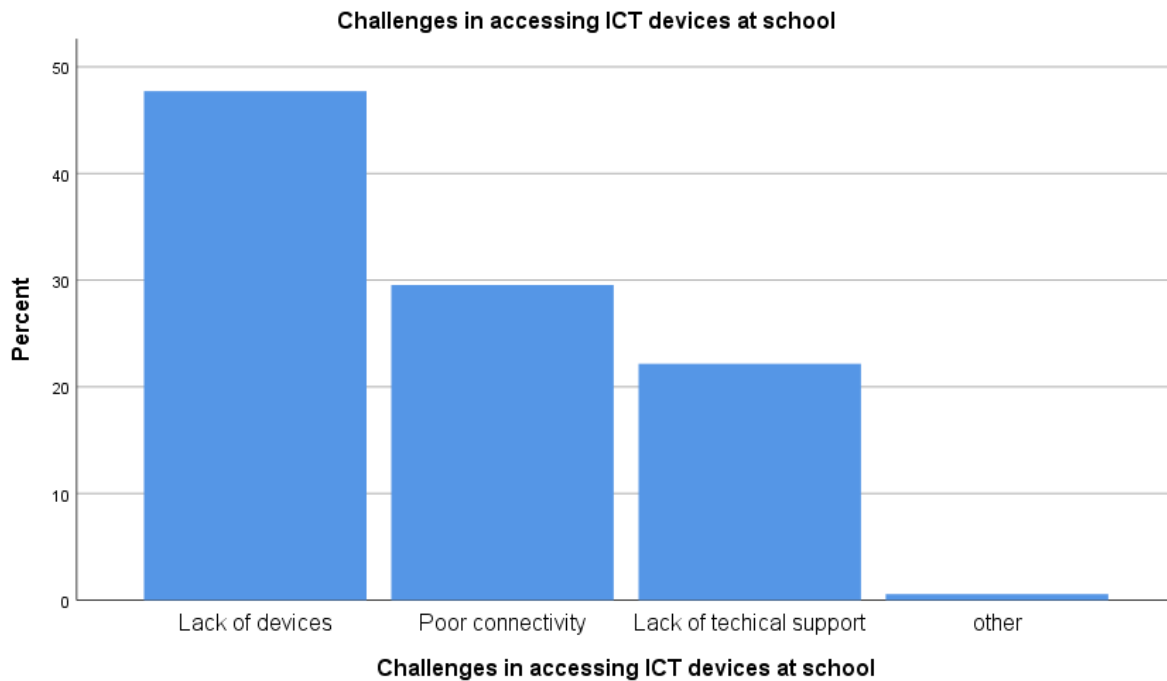


Figure 4.10: Challenges in Accessing ICT Devices at School

The learners were also requested to identify the challenges that they are facing at Finetown Secondary School. As shown in Figure 4.10, 47.7% (81 learners) indicated that the lack of devices is one of the primary challenges at the school, making it very difficult for them to utilize digital learning technologies in their education. Likewise, about 29.5% (50 learners) reported poor connectivity as a barrier affecting their ability to access and utilize online resources in their learning activities. Additionally, learners also indicate that the lack of technical support is a challenge, affecting their access to and use of ICT in their learning activities. This was reported by 22% of the respondents (37 learners). Chisango and Marongwe (2021) had identified the same challenges of the unavailability of technical support

These findings also manifest in the perceptions of teachers, as revealed in interviews conducted with teachers regarding ICT access in classrooms, which demonstrate that access to and use of ICT in teaching and learning are constrained by several factors. Teachers revealed that there is limited application of ICT in teaching and learning, despite laptops having been provided. T1 explained:

“we do have laptops, but they are mostly used for administration work like preparing lesson plans or typing reports. It is frustrating because we know the potential of ICT in our teaching, but without internet connectivity and additional tools, we cannot use them effectively in our classrooms.”

The same sentiments were raised by T2, who stated:

“The laptops we have are only useful for personal tasks, but when it comes to teaching, they are not as helpful because we do not have projectors or smartboards to make full use of ICT. It is like having a tool that you cannot use because you are missing other parts.”

The views and sentiments of teachers align with the responses of learners in their questionnaire when they reported that there is no use of ICT in teaching methods at Finetown Secondary School, as 83% (148 learners) reported that teachers never used ICT for teaching. This points to an overwhelming absence of ICT use in the classrooms, which hinders the effective and efficient delivery of modern, interactive and intellectually engaging educational experiences.

4.5.2 Difficulties in using ICT for learning

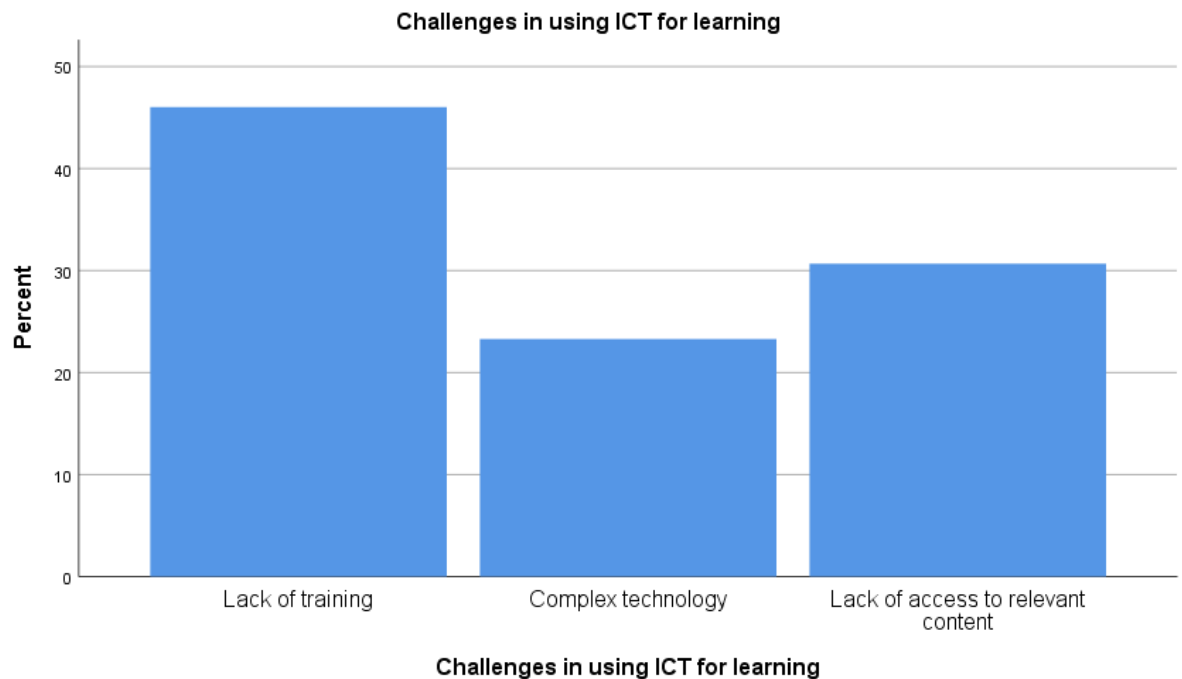


Figure 4: Challenges in Using ICT for Learning

The responses to the questionnaire, as shown in Figure 4.11, indicate that approximately 46.0% (78 learners) reported a lack of training as the primary factor affecting their use of ICT for learning purposes. Many learners reported that they are inadequately equipped or trained to use ICT effectively in their learning. Likewise, 23.3% (39 learners) indicated that technology was a challenge and difficulties in navigating digital tools were a hindrance. Even among learners who indicated having access to ICT, 30.7% (52 learners) identified challenges in accessing relevant online content. These findings highlight that, despite having access to ICT devices, the content available online does not meet their learning needs. In terms of the Technology Acceptance Model, these challenges address two key components: perceived usefulness and perceived ease of use. The lack of training decreases learners' confidence and their ability to effectively use ICT (Aguilera-Hermida, 2020). This negatively impacts their perception of its ease of use. Furthermore, the strain of accessing appropriate educational content online diminishes the perceived

usefulness of ICT, making learners less motivated to integrate ICT tools into their learning activities (Adukaite, Van Zyl and Cantoni, 2017). These findings clearly reflect the need to provide sufficient training to learners at Finetown Secondary School, enabling them to fully maximise the opportunities presented by ICT technologies in education. These findings underscore the need for targeted interventions to address these gaps and empower learners to fully leverage ICT opportunities in education.

4.5.2 Challenges experienced in the classroom

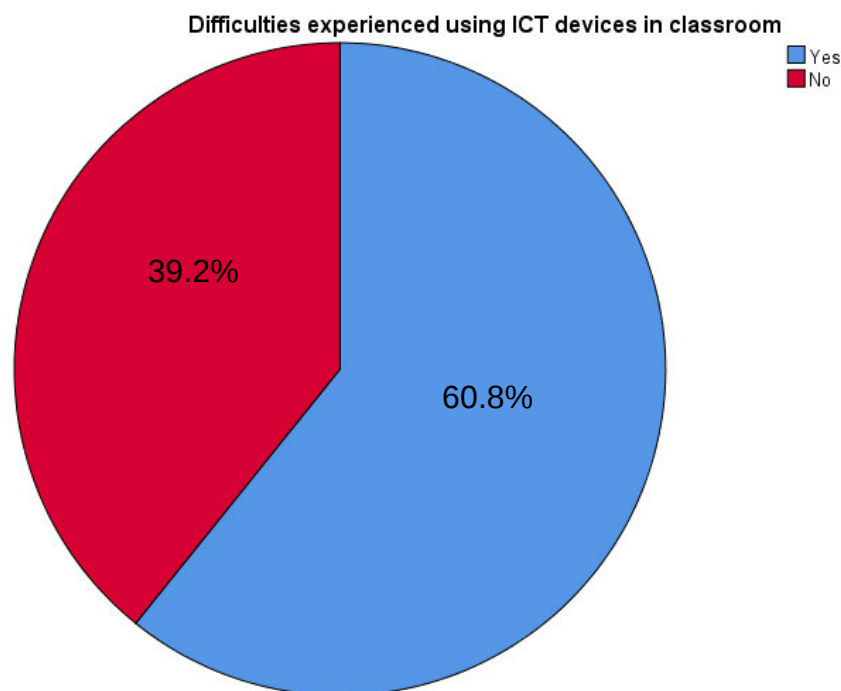


Figure 4.12: Challenges Experienced in the Classroom

Figure 4.12 shows that learners experienced difficulties with the use of ICT devices in the classroom, as 60.8% (103 learners) reported encountering challenges with these devices. Only 39.2% (67 learners) reported that they did not face difficulties in the classroom when using ICT devices. The high response rate of learners indicating that they face difficulties is a reflection of the serious challenges to the effective integration of ICT in learning activities at the school.

The issues raised by learners were also highlighted by teachers, who acknowledged that although the benefits of ICT are recognised at Finetown Secondary School, many teachers lack the practical knowledge and experience necessary for effectively integrating ICT into their teaching and learning processes. It was revealed that the skills gap primarily stems from a lack of training and support in ICT integration. Chigona and Chigona (2010) point out that teachers who are not trained lack confidence and are unlikely to incorporate technology into their pedagogical practices.

Most of the teachers interviewed demonstrated an understanding of the theoretical advantages of using ICT in their teaching. However, they were uncertain about how to practically apply these tools to enhance the classroom experience and learning outcomes. T4 revealed:

“We all know that ICT can make a difference in terms of the teaching and learning experience of learners. However, only a few of us know how to incorporate it into our teaching. We have never been exposed to proper training in terms of how to use educational software and interactive tools in the classroom. Even if you have access to ICT devices, most of us would know would not know how to use them to their full potential.”

These concerns were also shared by T7, who stated:

“I have heard a lot about the use of ICT in classrooms and how it can transform education, but no one here at Finetown has shown us how to use these tools effectively. We need proper training on how to use these devices and tools effectively. Currently, we are left to figure it out on our own, which is not ideal in this digital era.”

The lack of practical knowledge of ICT implementation affects the confidence of teachers in terms of ICT usage. Research by Lau and Sim (2008) and Chigona and Chigona (2010) has shown that teachers who do not feel prepared and confident in using technology are less likely to integrate it into their pedagogical practices. These interviews highlight the gap between the theoretical understanding of ICT in teaching

and learning and its practical application. Teachers demonstrated an understanding of the concept of ICT, but showed a real challenge in terms of knowing how to utilize it to enhance learner engagement and learning outcomes. This finding points to the need to address this gap through comprehensive training and continuous support, as it is crucial to empower teachers to utilize ICT effectively in their pedagogical practices. Hsu (2010) has argued that a teacher who is well-trained in the use of ICT is most likely to use it in the classroom.

4.5.3 Lack of Resources

From the interviews conducted, it was evident that one of the challenges affecting access to ICT is the lack of sufficient resources. Both learners and teachers were found to be affected by the shortage of essential ICT tools, which limits the effective integration of ICT into the teaching and learning process. Although it was reported that some laptops were provided to teachers, their use was found to be very minimal. Additionally, no ICT tools or devices were available for student use in the classroom during the learning process. As a result, it was found that learners were unable to engage with ICT during the learning process, and their teachers were left without the tools to fully leverage the potential of ICT in their teaching.

This was explained by T1, who said,

“we have a few laptops for teachers, although they are not enough to meet the needs of everyone. We do not have any computers or tablets for our learners, and they make it very impossible to integrate ICT into teaching and learning the way we would like to see the lack of devices for learners is a real challenge in their learning process.”

Likewise, the study noted an absence of essential classroom ICT tools, such as projectors, interactive whiteboards, and smartboards, which further compounded the issue. These tools were acknowledged during the interviews as important for creating engaging and interactive lessons. However, they were not available at this school. All the teachers interviewed agreed that without such tools and applications, teachers are forced to use outdated and less efficient teaching methods, such as

textbooks and photocopies. Chisango and Marongwe (2021) arrived at similar findings, noting that teachers and learners in disadvantaged schools in Gauteng lacked the devices necessary to facilitate technology-based learning. These further disadvantages these learners from poor communities. Furthermore, another challenge that affects access to and usage of ICT is the lack of internet connectivity at the school, especially in classrooms, which makes it impossible for teachers to use and integrate digital content in real-time during lessons. T4 noted that

“the internet is only available in the administration office, and even there, it is not reliable. We do not have internet in our classrooms, and as a result, we cannot use online resources, even educational websites during our lessons delivered”,

Generally, the lack of ICT devices and technologies, combined with the absence of reliable internet connectivity, poses significant challenges to the effective and efficient use of ICT to promote efficient teaching and learning at this school. These challenges were found to be limiting the ability of teachers to integrate ICT into their practices.

4.5.4 Infrastructure Limitations

One of the main issues that emerged during the interviews with teachers regarding the challenges affecting the integration of ICT to promote efficient teaching and learning is infrastructure limitations. Chisango (2019) noted that even though the Gauteng Department of Education started rolling out ICT to schools in 2015, there are schools with insufficient ICT infrastructure in the province. The interviews with teachers revealed that the lack of internet connection in classrooms affects the ability of teachers to utilize online resources during the delivery of their lessons.

It was also noted that although some internet access is available in the administration offices, it does not extend to the classrooms, creating a digital barrier that hinders the integration of ICT-based tools and interactive platforms necessary for modern education. T6 stated that

“Without access to the internet in classrooms, we are always limited in what we can do with ICT. We can't access online resources that could not enhance our lessons, and it is frustrating because our learners are missing out on digital learning opportunities that could greatly assist them.”

The absence of Internet access and critical teaching tools further exacerbates these challenges because these resources are part of the everyday learning process, and they help in creating dynamic and engaging lessons, which can create interactive learning. Chisango and Marongwe (2021) also found that most learners in poor schools in Gauteng lacked wi-fi access, learners could not afford to buy data, and there were serious network connection problems. In their study, they argued that schools in disadvantaged communities are unprepared for the demands of the transition to ICT-based learning. Therefore, without access to the internet and related digital tools, teaching and learning remain teacher-centred and traditional, relying much on printed materials.

These findings align with Van der Berg and Spaul (2020), who argue that the poorest in South Africa have limited to no access to ICTs, such as computers and the internet. From the study, it was clear that the lack of infrastructure not only affects the ability of teachers to implement ICT in their teaching but also contributes to the growing gap in awareness and usage among learners. With classrooms lacking basic ICT tools to support learning, both teachers and learners are not allowed to fully experience the potential of modern technologies. In education.

4.5.5 Challenges in Awareness and Training

The study also noted that there are challenges in awareness and training at this school. It was noted that the lack of training and awareness initiatives for teachers is limiting the integration of ICT into teaching and learning processes. Teachers interviewed highlighted that they have not received adequate professional development, which enables them to effectively utilise ICT technologies and tools in their classrooms. This was so despite several teachers interviewed recognizing the

potential benefits of ICT technologies, such as easier access to important information that can enhance the delivery of lessons.

In the absence of structured training and targeted programs, many teachers continue to struggle with implementing these tools in practice. T8, who was interviewed, highlighted that,

“Yes, we are aware that ICT can make our teaching a lot easier and interactive, but here we have never been trained in terms of how to use these technologies in our lessons. Many of us are unsure about how to effectively incorporate and integrate ICT into our teaching practices beyond basic literacy and tools. As much as training is provided here and there, it is not regular or thorough enough to enable us to meaningfully integrate ICT into our learning and teaching practices.”

This lack of awareness initiatives has led many teachers to feel unsure about how to fully utilise the available ICT resources. In as much as they showed an understanding of the concept of ICT integration, the absence of hands-on training implies that the implementation of ICT in a classroom remains a pie in the sky. The gap between awareness in the practical application of ICT limits its overall impact on teaching and learning. The same sentiments were also expressed by T2, who highlighted that

“without proper training, it is impossible to use ICT in my teaching. As many as several workshops had been held and conducted, they were more about showing teachers how to use computers, rather than how to incorporate them into lesson delivery.”

At the end of the day, the training sessions conducted did not address the real challenges being faced in terms of the integration of ICT into teaching and learning.

4.5.6 Socioeconomic Factors

From the interviews conducted, it became clear that socio-economic factors significantly contribute to the challenges that hinder the integration of ICT in teaching

and learning. Many learners at this school were found to come from families and households with low-income levels, where access to ICT tools and resources, such as computers, laptops, and smartphones, is limited or non-existent. The financial constraints and challenges of their family backgrounds suggest that these learners do not have the opportunities to practice and utilise ICT technologies outside of school. This resonates with van Dijk's (2008) model, which highlights that accessibility to ICT infrastructure is linked to the cost of ICT devices, which in turn is influenced by the socio-economic status of an individual, family, place, or school. Therefore, socioeconomic status not only creates a digital divide between Finetown Secondary School and other better-resourced schools, but also creates a significant divide among learners within the school. T5 said that

“most of the learners here come from poor backgrounds, and they are not in a position to afford to buy data or gadgets like laptops and smartphones. Therefore, even if there is the intention to give them ICT-based homework, it will not be realistic, because they do not have the necessary means to do the task.”

This finding resonates with Rasoo and Naidoo, (2024), who illustrate the persistent inequality in schools when they looked at the sustainability of ICT in previously disadvantaged public schools in Gauteng. In general, the absence of ICT access outside the school at home compounds this issue for teachers, especially when they want to incorporate technology-based tasks in their teaching methods. The study noted teachers' frustration since they were not in a position to embrace ICT for projects and homework, with T7 stating that,

“as much as I want to utilize ICT in my lessons. I feel helpless because I'm aware that most of my learners will not be able to afford it due to their financial backgrounds. These financial and socio-economic disparities are reflecting the challenges of inequality in education.”

4.6 Summary of the Chapter

Chapter Four presents the findings from a mixed-methods study conducted at Finetown Secondary School in Johannesburg, focusing on the access, awareness, and use of Information and Communication Technology (ICT) among grade 11 learners. The quantitative data, collected from 100 learners via questionnaires, revealed a male-dominated participant group (65.9%), with most learners aged 18 (39.8%) and from low-income families (64.8% earning below R5,000 monthly), alongside parents with predominantly high school education (73.9%). While 72.7% of learners had access to personal ICT devices at home, only 10.2% had access at school, and 88.6% reported never using ICT in the classroom, highlighting a significant digital divide exacerbated by inadequate infrastructure and training. Qualitative data from teacher interviews indicated limited ICT integration training, resulting in low skill levels and dissatisfaction with ICT use. Key challenges included a lack of devices, poor connectivity, and insufficient training, aligning with the Technology Acceptance Model's emphasis on perceived ease of use and usefulness, underscoring the need for targeted interventions to enhance ICT integration and digital literacy.

Chapter Five

Discussion of Findings

5.1 Introduction

This chapter provides a discussion of the key findings from the study conducted at Finetown Secondary School. The study focused on the issues of access, awareness, and use of Information and Communication Technology (ICT) to promote efficient teaching and learning among grade 11 learners. The discussion is underpinned by the Technology Acceptance Model (TAM), which posits that perceived ease of use (PEOU) and perceived usefulness (PU) are crucial determinants of technology adoption. This chapter aims to provide a deeper understanding of the challenges and opportunities for ICT integration in a township school context, linking the findings to the Technology Acceptance Model and relevant literature. The discussion is structured around three main themes that are derived from the research objectives. The focus areas are:

- access, awareness, and usage;
- challenges affecting ICT integration;
- discussion of findings from interviews with teachers

These identified areas address the research objectives and help to answer the major research questions of the study and demonstrate the practical implications for ICT integration.

5.2 Discussion of Findings from Learners

This section covers the discussion of the findings that emerged from the responses of the learners to the questionnaire. These findings are analyzed and discussed in light of the TAM model and the available literature.

5.2.1 Access, Awareness, and ICT Usage in the Classroom

The study disclosed that there is a sharp contrast in ICT device availability between school and home environments. At home, 72% of the respondents (122 learners) interviewed reported that they had access to personal ICT devices, while only 10.2% (17 learners) indicated that they had access to an ICT device at school. Thus, from the findings, classroom usage of ICT devices was more limited, with 88.6% of the respondents (151 learners) indicating that they never used ICT devices for learning and educational purposes. The study also revealed that outside school, 43.2% (73 learners) used ICT on a daily basis, demonstrating that there is a reliance on personal devices, rather than school-provided resources.

From the lens of the term perspective, the availability of ICT devices has a direct influence on the perceived ease of use and perceived usefulness (Ajina et al., 2024). Learners, who have access to personal devices at home have got a better likelihood to perceive ICT as easy to use because of the familiarity and regular interaction. These findings are in alignment with Davis (1989), who introduced the TAM and also emphasized that regular exposure to technology helps to enhance user comfort and confidence, which in turn increases the perceived ease of use.

Equally, Halim et al (2022) proceed that access to digital tools helps to transform education by facilitating self-directed learning, which is a trend evident in 43.2% of the respondents (73 learners). using ICT daily outside of Finetown Secondary School (Morris and Rohs, 2023). This is consistent with the research by Pavez, Novoa-Echaurre and Salinas-Layana (2024), who underscored that personal device ownership helps to empower students to explore digital resources independently, often compensating for the gaps in the formal education system, particularly in rural areas.

However, the limited availability of ICT devices at school reduces the perceived use of ICT devices as learners cannot integrate ICT into their learning processes (Maphosa, 2021). This disjuncture is supported by the findings of Tibane et al. (2024), who highlighted that a lack of school-based access disadvantages learners,

particularly those in under-resourced settings like Finetown Secondary School. A study by UNESCO (2021) supports this, as it demonstrated that equal access to ICT in schools aggravates educational inequities by limiting opportunities that are available for students and learners to develop digital skills that are important for modern economies.

Likewise, Venkatesh and Davis (2000) extended their TAM by introducing new concepts of external variables, such as infrastructure availability, demonstrating that without reliable access, perceptions of usefulness are limited, limiting the adoption of technology. Thus, in the context of this study, the minimum use of ICT in a classroom reflects the infrastructural deficits that are characteristic of many rural South African schools. This has also been noted by teachers who demonstrated that the absence of tools like projectors and smart boards in this also supports the notion by Dlamini (2022), who disclosed that insufficient infrastructure is a primary challenge to ICT integration in many South African schools. Their study particularly pointed out that the lack of functional hardware and reliable electricity is a key obstacle, which is a real reality that is mirrored in the findings at Finetown Secondary School.

Additionally, Motani (2022) had argued that the integration of ICT into classrooms requires not only hardware but also the training of teachers as well as institutional support, which are elements that are often absent in an under-resourced context like the one under study. The TAM suggests that without consistent access, teachers and learners perceive ICT as less useful, which then hinders its adoption, perpetuating a cycle of underutilization. These findings are further corroborated by the Diffusion of Innovation Theory, which posits that the rate at which technology is adopted slows when enabling conditions such as infrastructure and resources are inadequate (Mbatha, 2024).

5.2.2 Awareness of ICT Benefits in Learning

The study demonstrated that there was a notably low awareness of ICT benefits, as only 94.3% (160 learners) reported that there are no school-based programs or

initiatives aimed at promoting ICT value, and 65.9% of the respondents (112 learners) interviewed perceived no impact of ICT of their learning on their learning experiences. The teachers who took part in the study also acknowledged the potential of ICT, but demonstrated a lack of practical knowledge to demonstrate its benefits in classroom processes. Therefore, the gap between the practical application of ICT and the theoretical awareness is a critical finding in the context of this study.

The TAM also demonstrates that perceived usefulness is influenced by a number of factors, including an awareness of the benefits of technology (Abdullah, Ward and Ahmed, 2016). Thus, the absence of awareness campaigns at Finetown Secondary School limits the teachers' and learners' recognition of the utility of ICT in enhancing engagement and academic outcomes. This is supported by a study by Jita and Munje (2020), whose study on South African schools exposed that without structured efforts to demonstrate the role of ICT in enhancing learning processes, educators and learners remain doubtful of the value of ICT, which directly undermines the perceived usefulness.

This finding is further corroborated by UNESCO (2019), which underscored that awareness initiatives help to bridge this gap by demonstrating practical applications, inclusive of interactive learning tools and access to online resources, which make the abstract benefits of ICT more tangible. For example, a study by Rafi, JianMing and Ahmad, (2019) revealed that exposure to the benefits of ICT through demonstrations or workshops increases digital literacy in the rates of adoption among learners in resource constrained environments, the lack of such initiatives at Finetown Secondary School reinforces low perceived usefulness and reduce the motivation of learners to engage with ICT in their learning processes, which is a trend that is consistent with Buabeng-Andoh, Yaokumah and Tarhini, (2019) Theory of Planned Behavior, where the perceived benefits of ICT derive drive the behavioral intend to use it.

The awareness of ICT benefits is further complicated by teachers' theoretical understanding without actually having practical skills. A study by Chigona and

Chigona (2010) argued that a lack of teacher training makes them struggle to model the benefits of ICT effectively. This finding is mirrored by the situation at Finetown Secondary School. The research by Chigona and Chigona (2010) revealed that educators who do not have hands-on experience with ICT fail to showcase its relevance, and this leaves learners unconvinced of the impact of ICT. This finding also aligns with Koshier and Misha (2009), TPACK framework, which further emphasizes that effective technology integration demands not only knowledge of ICT potential, but the ability to apply ICT pedagogically, which is a skills gap in it that is evident among teachers at fine term secondary school.

5.2.3 Patterns of ICT Usage in the Classroom

The study found that the usage of ICT in classrooms was negligible, with 88.6% of the respondents (151 learners) interviewed reporting no integration of ICT in their learning activities. The teachers primarily indicated that they use ICT only for administrative tasks, such as learning lesson planning, rather than for pedagogical purposes. They cited inadequate resources and a lack of training as reasons for the lack of ICT usage. Obviously, this pattern is in sharp contrast with the 43.2% (73 learners) daily usage of ICT outside the school, demonstrating a huge disjuncture between formal and informal. ICT engagement, the technology acceptance model explains that Sir.

From the perspective of the TAM, this can be explained through the perceived ease of use and perceived usefulness, the lack of classroom infrastructure, such as projectors, reliable internet and functional devices diminishes the perceived ease of use as learners and teachers face technical challenges for ICT integration (Kundu and Bej, 2021). The study by Kundu and Bej (2021) in resource-scarce environments found that a lack of consistent access to working technology creates frustration, deters its usage and reinforces the perception that ICT is challenging.

Likewise, the absence of training reduces the perceived usefulness as teachers fail to leverage and harness ICT to improve teaching. These align with Masango, Van Ryneveld, and Graham's (2020) findings on South African teachers' failure and

reluctance to integrate ICT due to inadequate support. Their research demonstrated that teachers in under-resourced schools often see ICT as an extra challenge, rather than a tool that can be used for innovation when there is no professional development. However, 43.2% (73 learners) daily usage of ICT outside school suggest higher levels of perceived ease of use among learners with personal devices at home, and this supports the accession by TAM that familiarity with ICT drives adoption, the work of Almaiah, Alamri, and Al-Rahmi, (2019) on mobile learning, it demonstrated that students who are familiarized to personal technology, perceived ICT is intuitive, and this increases their willingness to engage with ICT independently. This disjuncture demonstrates a broader trend that exists in many disadvantaged schools in South Africa, where ICT remains at the periphery of educational processes, Chisango et al., (2020) carried a study in rural South African schools and exposed the limited institutional investments which keeps ICT at the margins, with teachers then defaulting to their familiar tools like chalkboards, chalkboards and textbooks. This supports the findings by Mwapwele et al. (2019), who demonstrated that in low-resource environments, the lack of a supportive ecosystem, together with infrastructure, prevents ICT from transitioning from potential to practice. This is demonstrated by the dependence on traditional methods of teaching, despite the proven benefits of ICT, such as allowing critical thinking and collaboration. The TAM attributes this scenario to external issues like training and infrastructure, which is a perspective that is reinforced by Venkatesh et al (2003) whose Unified Theory of Acceptance and Use of Technology (UTAUT) identified facilitating conditions for ICT usage, such as the availability of resources, which are conditions that are absent at Finetown Secondary School, ultimately reducing the pedagogical impact of ICT.

5.3 Challenges Affecting Access, Awareness, and Use of ICT

These challenges are multifaceted and include technical issues, inadequate devices, lack of support and insufficient training on how to use these devices efficiently. Mkhize and Davids (2021) found similar challenges when they looked at ICT usage in township schools in South Africa. In terms of the TAM perspective, technical issues and lack of training reduce the confidence of learners as well as their ability to interact

efficiently with ICT tools. When ICT devices are inaccessible or when their potential for the enhancement of learning is affected by technical issues, learners are likely to view them as less beneficial to their learning activities (Rahiem, 2020). Therefore, addressing these barriers is essential to fostering a conducive environment where ICT tools can be integrated successfully to enhance teaching and learning at Finetown Secondary School.

5.3.1 Infrastructure and Resource Limitations

The study disclosed several infrastructural challenges that include limited devices, a lack of internet in classrooms, as well as a lack of tools like projectors. The teachers who were interviewed noted that the few laptops that are provided are insufficient and are primarily used for administrative tasks, leaving learners without access to internet devices at the school. These findings align with what Chisango (2019) found when he argued that infrastructural challenges in Gauteng schools are continuing despite the efforts of the provincial department. The research by Chisango (2019) revealed that even in relatively urbanized areas like Gauteng, the allocation of resources fails to reach the classrooms, leaving the schools unprepared to implement Digital Learning Strategies.

TAM provides a deeper understanding of findings. From the perspective of TAM, the perceived ease of use and perceived usefulness of technology greatly affect its acceptance and use (Abdullah, Ward and Ahmed, 2016). The lack of devices and poor connectivity at Finetown Secondary School diminishes the ease with which grade 11 learners can engage with ICT tools. As a result, this makes them less likely to perceive these technologies as beneficial or useful in their learning. These responses are an indication that there is insufficient assistance rendered to learners to address technical issues and to maximize ICT technologies in their learning activities. Only a small proportion of the respondents, 0.6%, (11 learners) mentioned other challenges. This further highlights that major issues affecting how learners access and utilize ICT technologies in their learning activities at Finetown Secondary School are lack of technical support, devices and Internet connectivity.

The TAM perspective highlights that infrastructure impacts directly the perceived ease of use Davis (1989). Thus, without reliable internet and devices, teachers and learners at Finetown school encounter technical difficulties that reduce their willingness and confidence to use ICT much longer by 2023. The study by Mhlongo et al., (2023) in South African rural and peri-urban schools demonstrated that and unreliable infrastructure results in a sense of frustration, limiting users from engaging with ICT technologies even when they are available. This finding aligns closely with the Zenda and Dlamini (2023), who highlight that there are complexities of technology which are, for example, exacerbated at Finetown school by poor infrastructure, which actually slows the rate of ICT adoption. Furthermore, Aruleba and Jere (2022) corroborate this finding, as they noted that the poorest schools in South Africa, including those in disadvantaged urban areas, do not have basic ICT resources like electricity and internet connectivity, and this aggravates the digital divide. This analysis of educational inequality underscores and demonstrates the challenges that affect historically underserved communities, which lock them into a cycle of technological exclusion.

At Finetown Secondary School, this challenge forces the school to rely on outdated methods like textbooks and chalkboards, which undermine the perceived usefulness as the benefits of ICT, such as interactive learning and access to online global resources remain underutilized and unrealized. This aligns with the findings of Frans and Pather (2022), who argue that with adequate financial infrastructure, the transformative potential of ICT technologies in learning and teaching remains theoretical rather than practical, which is the case in many South African contexts. Likewise, the TAM emphasized external variables and suggested that the absence of enabling and conditions limits the perceptions of ICT as a valuable tool in teaching and learning. UNESCO (2021) also supports this, demonstrating that schools globally with similar resource challenges struggle to integrate ICT, which perpetuates dependence on traditional methods of teaching and learning, contributing to the widening of the digital literacy divide.

5.3.2 Skills Gap and Training Challenges

Another challenge that was evident in this study was the skills gap, with 39.3% of learners rating themselves as beginners in terms of ICT usage, and 98.3% reporting that they have never encountered any formal training at school. Teachers also echoed similar sentiments, citing that the regular training they received focused only on administrative tasks, such as record keeping, rather than pedagogical integration of ICT. It was only 0.6% of the respondents (1 learner) who indicated that we had received basic training, of which 47.7% (81 learners) reported rating it as poorly, underscoring its inadequacy. Looking at this from a perspective of the technology acceptance model, which links skills directly to the perceived ease of use, this suggests that inadequate training reduces the ability of users to navigate the issues of ICT effectively.

Research on technology adoption during remote learning, especially in the context of COVID-19, found that sufficient skill building, without sufficient skill building, users perceive ICT as challenging and intimidating, which decreases their willingness to engage with it (Geert et al., 2023). This is mirrored exactly by the situation at Finetown Secondary School, where there is no structured training, which leaves both teachers and learners ill-equipped. Graham et al (2020) found similar conclusions in South African schools, noting that untrained teachers avoid ICT because of low confidence and self-efficacy, which is a concept rooted in Bandura (1977) where perceived incompetence affects action. Therefore, sporadic surface-level training fails to prepare teachers for the integration of ICT in the classroom at Finetown Secondary School, which perpetuates a cycle of avoidance. The near total absence of training for learners limits digital literacy development, and this is noted by Mwapwele et al. (2019), whose research in South African township schools demonstrated that without formal ICT training, learners struggle to acquire foundational skills, which are very critical for 21st-century education. This finding aligns closely with Buckingham's (2007) argument that digital literacy requires deliberate cultivation, especially in under-resourced settings where informal exposure alone is not adequate. Therefore, the focus on basic skills without practical

application diminishes and reduces the perceived usefulness, as neither learners nor teachers will view ICT as important to their classroom needs. Chigona and Chigona (2010) came to similar conclusions, highlighting that when training focuses mainly on administrative issues over pedagogical issues, teachers fail to demonstrate the value of ICT in enhancing learning and teaching outcomes, and this leaves the potential of ICT untapped. This finding is consistent with Koehler and Misha (2009) TPACK framework, which stresses that the use of ICT demands and requires the blending of technological, pedagogical and content knowledge, which are factors that Finetown Secondary School was found to be short of.

5.3.3 Socioeconomic Barriers and Digital Divide

Another challenge that emerged from the findings is socioeconomic factors, as 64.8% of the respondents (110 learners) indicated that they came from families that earn less than 5000 rand per month, and 73.9% (126 learners) indicated that their parents had only secondary education or less. Teachers corroborated this finding, citing that the inability of learners to afford personal devices and data at home affects how these learners access ICT at school. This aligns with Van Dijk's (2008) model of ICT access disparities. The framework by Van Dijk (2008) emphasizes that the digital divide moves beyond the physical access to incorporate issues like material, motivational and skills-based dimensions, which are factors that are evident at Finetown Secondary School, where economic challenges affect both ownership and usage of ICT outside the classroom.

The TAM model indicates that external issues like socioeconomic status impact the perceived usefulness and the perceived ease of use indirectly (Davis 1989). Learners coming from low-income households view ICT as less important because of their limited exposure and restricted access, both at home and at school. This prevents them from experiencing the potential benefits of ICT in education, such as accessing online resources and interactive tools. This issue is further aggravated by the lower educational levels of their parents, as indicated by 73.9% of the respondents (132 learners) who indicated that their parents had secondary education or less. This reduces the capacity of learners and parents to support the

use of ICT, further reducing the perceived ease of use (Rasoo and Naidoo, 2024). The study by Rasoo and Naidoo, (2024) in South African township schools demonstrated that parental education correlates strongly with the confidence of learners in utilizing technology as parents who are less educated are less likely to encourage or model digital engagement. This finding aligns with the cultural capital concept of Bourdieu (1986), where families with limited educational resources find it difficult to transmit the attitudes and skills that are needed for the adoption of technology. Likewise, the digital divide was clearly seen at Finetown school, and this mirrors Zenda and Dlamini, (2023) findings that demonstrates how financial disparities widen the technology gaps affecting equitable education in South Africa. Therefore, the findings of this study demonstrate that socioeconomic status shapes not only access, but issues of quality of ICT experiences with low-income learners often pushed to use outdated or shared devices, if any, as compared to their wealthier peers. It is on this basis that Steyn (2024) posits that the legacy of apartheid is still evident in such inequities as schools like Finetown Secondary School, as they continue to bear the brunt of underfunding and parental economic marginalisation.

5.3.4 Pedagogical and Institutional Challenges

The study demonstrated that pedagogically, teachers were found not to have practical knowledge of ICT integration as they continue to rely on traditional methods like chalkboards and lectures, despite the fact that they recognize the potential of ICT to enhance engagement and learning outcomes. Institutionally, about 93.2% of the respondents (158 learners) indicated that measures to improve ICT were inadequate, demonstrating the lack of effective policy implementation at Finetown Secondary School. These findings align closely with Aruleba and Jere (2022), who found out how township schools struggle with the adoption of ICT in South Africa. Thus, in the context of this study, a combination of the unpreparedness of teachers and institutional challenges prevents meaningful ICT integration, leaving the school stuck in outdated, traditional pedagogical paradigms, even when ICT resources are introduced.

The technological acceptance model attributes such issues to low perceived usefulness and perceived ease of use emanating from a lack of institutional support and training (Isaac et al, 2018). The research by Isaac et al (2018) on technology adoption in school environments demonstrates that without institutional support and guidance, teachers continue to perceive ICT as impractical and challenging, thereby reducing the perceived ease of usefulness. This challenge is further worsened by a lack of professional development that is tailored to meet pedagogical needs. This is a gap that is also noted by Koehler and Mishra (2009) in their TPACK framework, which stresses that the effective integration of ICT requires the blending of teaching strategies with technological expertise, which affect us that are totally absent at Finetown Secondary School. Similarly, institutional weaknesses affect the perceived usefulness as educators and learners see little evidence of the relevance of ICT to classroom needs when support systems fail to materialize. These findings align with Damoah and Omodan (2022) and underscore how schools in under-resourced environments are affected by weak and poor policy execution, like failing to provide functional devices and reliable internet, which continue to reinforce the notions that ICT is peripheral, instead of being essential. Obviously, this creates a cycle where ICT continues to be underutilized, despite its potential for transformation of the educational sector. This is a situation that affects mainly township schools, which continue to face a policy practice-gap where ICT initiatives fail because of poor follow-through, leaving teachers and learners unsupported and disengaged.

5.3.5 Lack of Measures and Strategies for ICT Awareness and Access

When requested to indicate whether there were enough measures or strategies to improve ICT awareness and access, 158 learners, (93.2%) reported that they did not believe that they are adequate measures that are put in place to improve access to ICT at their school, it was only 6.8% of the 12 learners that reported that they are efforts being made to improve their access to ICT. When the learners were requested to indicate whether there were awareness initiatives about ICT benefits at Finetown Secondary School. The responses showed that the 160 learners (94.3%) believed that there are no strategies in place at the moment to promote the benefits of ICT for

learning to learners. It was only 5.7% of the respondents (10 learners) who felt that there are strategies in place to increase awareness of how ICT. This indicates a lack of concerted efforts to effectively communicate and demonstrate the value of ICT in education. The absence of such awareness initiatives affects how grade 11 learners at Finetown Secondary School understand the role of ICT in enhancing their learning experiences and outcomes. Munje and Jita (2020) also demonstrate the impact of a lack of ICT resources on teaching and learning in selected South African primary schools. TAM demonstrates that a lack of awareness initiatives and programs implies that learners are not sufficiently knowledgeable about the practical benefits of ICT in aiding their performance at school (Mafojane, 2021). This leads to a reduced acknowledgement of its value. Likewise, without exposure to examples of ICT applications, learners at Finetown Secondary School are likely to perceive ICT tools as complex and irrelevant in learning. Accordingly, this finding highlights the need for targeted programs to bridge this gap.

5.4 Summary of the Chapter

This chapter presented a discussion of the key findings from the study conducted at Finetown Secondary School. The discussion focused on data from the questionnaire distributed to learners. Data discussed focused on access, awareness, and usage; challenges affecting ICT integration, as well as a discussion of findings from interviews with teachers. The study focused on the issues of access, awareness, and use of ICT to promote efficient teaching and learning among grade 11 learners. The discussion was underpinned by TAM, especially the concepts of perceived ease of use (PEOU) and perceived usefulness (PU), which are crucial determinants of technology adoption.

Chapter Six

Summary, Conclusions and Recommendations

6.1 Introduction

This chapter provides a summary of the key findings of the study conducted at Finetown Secondary School. The study explored access, awareness and use of ICT to promote efficient teaching and learning among grade 11 learners. The main purpose of the chapter is to ensure that the study has succeeded in answering the main research questions and in meeting the objectives of the study. The chapter provides a brief outline of the major themes that emerged from the study, including the challenges and what they mean in terms of the present study. The chapter ends by providing recommendations as a way to guide future efforts at Finetown Secondary School regarding the integration of ICT to promote efficient teaching and learning. This chapter serves as the synthesis of the research, providing insights that can guide teachers, school management and policymakers.

6.2 Summary and Conclusions

This study was undertaken against a background of the rapid achievement in technology and how they are shaping modern society. There is no doubt that ICT has become the cornerstone of education globally, especially in how it fosters inclusive and equitable learning environments. In this regard, South Africa, through several legislative and programmatic initiatives, has underscored the significance of ICT integration into teaching and learning as a way to close the digital divide and promote a knowledge-based society (Makhura, 2015; GDE, 2007). However, despite the advancements that have been made post-1994, the adoption and integration of ICT in many schools in the country remains a challenge, particularly in rural and black township schools and in informal settlements. The study has demonstrated that Finetown Secondary School is facing challenges and is not utilizing ICT

resources. This is what Van Wyk (2014) noted when concluding that ICT capacity in schools is either underutilized or not used at all.

Likewise, this study discovered that the majority of teachers at Finetown Secondary School are computer illiterate and fearful of utilizing computers. Mlitwa and Koranteng (2013) have long raised concerns that there is widespread evidence that teachers are still struggling to navigate digital tools and integrate them effectively into their pedagogical practices. This has led to a huge gap between access to ICT and its utilization especially at schools like Finetown Secondary. This situation was made worse by the COVID-19 pandemic, which exposed these disparities in ICT access and usage, particularly between well-resourced and underprivileged schools. This was so because the shift to online learning, as well as blended learning, laid bare the digital divide, as many learners in underprivileged areas and informal settlements were left behind due to a lack of infrastructure and inadequate training to support ICT integration. It was on this basis that the study sought to investigate the issues of access, awareness and use of ICT at Finetown school to promote efficient teaching and learning.

The study was guided by the Technology Acceptance Model, which served as the theoretical framework for understanding the adoption and utilization of ICT in teaching and learning as discussed in Chapter Two. The Technology Acceptance Model focuses on the perceived usefulness and perceived ease of use as determinants of technology acceptance by investigating how these issues influence user behaviour. The technology acceptance model provides insights into the factors that drive successful ICT integration. The study leveraged on Technology Acceptance Model to explore access awareness and use of ICT to promote efficient teaching and learning at Finetown school, intending to provide insights in terms of how to improve teaching and learning outcomes.

The findings of this study revealed important insights into the level of access, awareness and use of ICT among grade 11 learners at Finetown Secondary School. This study generally highlights that several learners felt that there were no effective strategies aimed at promoting the benefits of ICT for learning. This finding suggests

that there is a huge gap in the school, particularly in terms of the efforts in place to enhance digital engagement, to support an environment that is conducive to the integration of ICT in education. The study has successfully demonstrated that access to ICT devices is limited, and the learners at Finetown Secondary School are struggling to navigate the technological tools that are necessary for modern education. This study thus aligns with Mashile (2017), who noted that ICT acceptance and integration in teaching are still behind the desirable level, particularly in black townships and in informal settlements.

The study has demonstrated that the challenges affecting access, awareness and usage of ICT at this school are multifaceted, and they are impacting the teaching and learning environment. Both teachers and learners consistently revealed that issues such as limited access to devices, inadequate infrastructure and the lack of technical support, impact how they utilize ICT. This was evidenced by the majority of learners who reported that their teachers rarely use ICT in classroom environments for learning purposes, further emphasizing the lack of effective ICT integration. Ojo and Adu (2018) noted similar challenges facing the effectiveness of the utilization of ICTs by high school teachers in their study in the Eastern Cape. The lack of devices at Finetown exposes the weakness of the GDE and their move to provide laptops and tablets to Gauteng public schools since 2014. As much as the idea was to give students digital access to learning materials and develop an e-learning-friendly teaching culture (Makhura, 2015), the situation at Finetown is a clear example that the digital divide still exists today.

The findings of this study reveal that while schools like Finetown are aware of the necessity for ICT use and integration into teaching and learning, there are significant challenges that are impeding its incorporation into education. Likewise, the study has successfully identified gaps in awareness and understanding of how to utilize ICT tools effectively in the classroom. Both teachers and learners recognize the benefits of ICT. However, a majority of them expressed that they are uncertain about how to practically apply these tools to enhance teaching and learning experiences. These

findings showcase the limited awareness of how to navigate digital tools, which further affects the effective use of ICT in teaching and learning environments.

The study has therefore met its objectives as it uncovers the challenges that hinder the successful use of ICT in teaching and learning. Factors such as limited access to devices, poor internet connection and insufficient technical support are among the primary barriers that need to be addressed as a matter of urgency. This affects ICT integration as integration presupposes a supporting infrastructure (Mwapwele, Marais, Dhlamini, and Van Biljon, 2019). The findings of this study raise questions regarding the extent to which educators in remote areas and informal settlements use ICTs. Likewise, the lack of training and professional development for teachers at this school was identified as a significant challenge affecting how teachers integrate ICT into their pedagogical practices.

These findings comprehensively demonstrate the obstacles and challenges that affect how ICT is used to promote efficient teaching and learning in addressing the measures that are currently in place to improve access, awareness and use of ICT to promote efficient teaching and learning at Finetown School. The findings of this study demonstrate that while there are some efforts in place, notably the provision of laptops to teachers, there were no efforts that were directed at providing laptops to learners, and the infrastructure remains inadequate.

Likewise, the study found that there were no awareness campaigns or targeted training sessions at Finetown Secondary School, reflecting a huge gap in terms of promoting the effective use of ICT in education. The findings of this study highlight successfully the gap that exists between the theoretical understanding of ICT and its practical implementation in teaching and learning environments. As much as teachers and learners are aware of the advantages of ICT, there is a lack of necessary skills and resources to ensure that ICT is utilized effectively to promote efficient teaching and learning.

6.3 Recommendations

The study recommends that to improve access to ICT devices at the school, it is important to address the availability of hardware resources. This should include the provision of more ICT devices and tools, such as laptops, tablets, and other digital devices, for both teachers and learners, to improve access. Such devices are important in facilitating modern teaching and learning experiences as they will enable learners to effectively engage with digital and online content, supporting collaborative and interactive learning experiences. Likewise, there is a need to increase the number of devices at the school to ensure that they are accessible to both teachers and learners. This should be the responsibility of the Department of Basic Education in partnership with school management and relevant stakeholders to ensure adequate budgeting and procurement of ICT devices.

There is a need to ensure that internet connectivity is reliable across the school premises. Reliable internet access is important for the effective use of ICT tools in teaching and learning. This is very important, given that poor connectivity negatively affects the ability to access online resources necessary for teaching and learning. Therefore, by addressing the challenge of ICT infrastructure, the school can make important strides towards the creation of a conducive environment for digital learning. The Department of Basic Education, in collaboration with the school governing body, should work together to ensure the consistent provision of reliable internet services. Another important aspect is the need to provide technical support to enable the successful use of ICT devices. Adequate technical support will ensure that both learners and teachers can troubleshoot issues and resolve their technical difficulties, receiving guidance on how to maximize the use of ICT tools. The school management must employ or even outsource dedicated ICT support staff who will be responsible for maintaining devices and assisting both teachers and learners with technical problems.

Providing comprehensive technical support is very important to sustain and enhance ICT use in teaching and learning. Likewise, to improve the practical ICT integration in teaching and learning practices. There is a need for regular, comprehensive

training sessions tailored towards teachers. These sessions should be aimed at equipping teachers with the necessary skills that they need to effectively utilise educational digital tools and resources. This is very important, given the fact that the teachers were found to understand the theoretical benefits of ICT but lacked the practical expertise to implement them successfully in their pedagogical practices. Thus, offering ongoing professional development and training helps teachers to be more confident in implementing ICT-based education to enrich their instructional methods and to create an environment that is more engaging for learner experiences. The Department of Basic Education, in collaboration with teacher training institutions and NGOs should organize these continuous professional development workshops.

In addition, incorporating innovative and interactive digital tools into classroom instruction is of paramount importance. This includes the use of interactive whiteboards, projectors and other educational digital tools that enhance collaborative and visual learning. When classrooms are provided with these resources, learners are allowed to engage in multimedia-supported lessons, and this fosters greater comprehension and retention of knowledge among grade 11 learners. The School governing body, supported by the Department of Basic Education, must ensure classrooms are equipped with these digital teaching aids, while teachers should take responsibility for integrating them into daily lessons.

Moreover, to improve awareness of the benefits of ICT among both teachers and learners, there is a need to organize awareness campaigns. This should also include educating the school community about ICT and its transformative potential. This will help to create a culture that values and appreciates technology-driven learning, and will help learners develop an improved understanding of ICT and how it can be used to support their learning experiences. The school management, together with district education officials, must spearhead these awareness campaigns, while learners and teachers should actively participate to embrace the culture of digital learning.

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Appendices

Appendix 1: Informed Consent for Children

Dear Learner,

My name is Sindiswa Khumalo, and I am doing research as part of my Master's degree at the University of KwaZulu-Natal, Pietermaritzburg Campus. I am inviting you to be part of my study, which is about how learners like you use Information Communication Technology (ICT) for learning in the classroom.

The title of my study is:

“Access to, Awareness, and Use of Information Communication Technology to Promote Efficient Teaching and Learning in the Classroom for Grade 11 Learners at Finetown Secondary School in Johannesburg.”

I would like to ask you some questions about your experiences with ICT for learning. Before you decide, let me explain what this means for you.

What will you need to do?

- If you agree, I will interview you about your thoughts and experiences with ICT in your classroom. The interview will take about 20 minutes.

Your rights

- You do not have to participate in this study if you do not want to.
- If you agree to participate, you can stop or leave at any time without any penalties.
- You can choose not to answer any question if you are uncomfortable.

What happens to the information you share?

- Your answers will only be used for my research.
- No one will know what you said because your name and personal information will not be shared.
- Everything you say will be kept safe in a protected file, and no one except me and my supervisors will see it. After 5 years, the information will be securely destroyed.

Will this interview be recorded?

I may need to record the interview so I don't miss anything important. You can decide if you are okay with that or not.

Who can you talk to if you have questions?

If you have questions about the study or want to talk about anything, you or your parent/guardian can contact:

1. Researcher: Sindiswa Khumalo
Email: 216008452@stu.ukzn.ac.za
Cell: [REDACTED]

2. Supervisor: Dr. Siyanda Kheswa
Email: Kheswa1@ukzn.ac.za
Phone: 033 260 6987
Research Ethics Office:
3. Email: HSSREC@ukzn.ac.za

Do you want to participate?

If you want to participate, please sign below. If you don't want to participate, that's okay too.

Declaration

I (your full name) understand what this study is about. I know I can stop participating at any time, and I agree to take part in the study.

I consent / do not consent to have this interview recorded (please circle one).

Your Signature: Date:
.....

...

Appendix 2: Informed Consent for Teachers

Parental Consent Form

Dear Parent/Guardian,

My name is Sindiswa Khumalo, and I am a Master's candidate at the University of KwaZulu-Natal, Pietermaritzburg Campus. The title of my research is: *Access to, Awareness, and Use of Information Communication Technology to Promote Efficient Teaching and Learning in the Classroom for Grade 11 Learners at Finetown Secondary School in Johannesburg.*

The aim of this study is to explore issues of access, awareness, and use of ICT to promote effective teaching and learning among Grade 11 learners at Finetown Secondary School. I am interested in interviewing your child to gather insights on their experiences and observations related to this topic.

Please note that:

- The information provided will be used for academic research purposes only.
- Participation is entirely voluntary. Your child is free to participate, decline, or withdraw from the research at any time without any penalties.
- All responses will be kept anonymous; neither your child's name nor any identifying information will be disclosed.
- The interview will take approximately 20 minutes.
- All records and associated materials will be stored in a password-protected file, accessible only to myself and my supervisors. In accordance with university policy, these materials will be securely disposed of after 5 years through shredding and burning.
- If you agree to allow your child to participate in this research, please sign the declaration attached to this statement (a separate sheet will be provided for signatures).

I can be contacted at: School of Social Sciences, University of KwaZulu-Natal, Pietermaritzburg Campus

Durban. Email: 216008452@stu.ukzn.ac.za

Cell: [REDACTED]

My supervisor is Dr. Siyanda Kheswa who is located at the School of Social Sciences, Pietermaritzburg Campus / Howard College Campus, Durban of the University of KwaZulu-Natal. Contact details: email Kheswa1@ukzn.ac.za. Phone number: 033 260 6987

The Humanities and Social Sciences Research Ethics Committee's contact details are as follows: University of KwaZulu-Natal, Research Office, Email: HSSREC@ukzn.ac.za

Thank you for your contribution to this research.

DECLARATION

I parent of
(*full names of participant*) hereby confirm that I understand the contents of this document and the nature of the research project, and I do give consent for my child to participate in the research project.

I understand that my child is at liberty to withdraw from the project at any time, should he/she so desire. I understand the intention of the research. I hereby give consent to participate.

I consent / do not consent to have this interview recorded (if applicable)

SIGNATURE OF PARENT/GUARDIAN

DATE

.....

Appendix 2: Questionnaire for Learners

Introduction

Thank you for participating in this survey. The purpose of this questionnaire is to gather information about your access to, awareness of, and use of information and communication technology (ICT) to promote efficient teaching and learning in the classroom. Your responses will be kept confidential and will only be used for research purposes. Please answer the following questions honestly and to the best of your ability.

Demographic Information

1. Gender:

Male ☐

Female ☐

Other

2. Age: _____

3. Grade: _____

4. What is your home language? _____

5. What is your ethnicity (Race)?

6 What is your family's monthly income range? Tick one that applies

Less than R5,000 ☐

R5,000 - R10,000 ☐

R10,000 - R20,000 ☐

More than R20,000 ☐

7 How many people are there in your household? _____

8 What is the highest level of education completed by your parents/guardians?

Primary school ☐

High school ☐

College/University ☐

Postgraduate studies ☐

9 Do you have access to a personal ICT device (e.g., computer, smartphone, tablet) at home? Yes ☐☐
No ☐

10 How often do you use ICT devices (e.g., computers, smartphones, tablets) outside of school?

Daily ☐

Weekly ☐

Monthly ☐

Rarely ☐

Never ☐

11 Do you have access to ICT devices (e.g., computers, smartphones, tablets) at school?

Yes ☐

No ☐

12 How often do you use ICT devices in the classroom for learning purposes?

Daily ☐

Weekly ☐

Monthly ☐

Rarely ☐

Never ☐

13 How would you rate your ICT skills?

Beginner ☐

Intermediate ☐

Advanced ☐

14 Have you received any ICT training at school?

Yes ☐

No ☐

15 Have you received any formal ICT training at school?

Yes ☐

No ☐

16 If yes to the above, what was the nature of the training? Tick all that applies

- Basic computer skills ☐
- Specific software training ☐ (please specify): _____
- Internet and online resources ☐
- Programming or coding ☐
- Other (please specify): _____

17 How would you rate the quality of the ICT training you have received?

- Excellent ☐
- Good ☐
- Average ☐
- Poor ☐

18 How often are ICT training sessions conducted at your school?

- Daily ☐
- Weekly ☐
- Monthly ☐
- Rarely ☐
- Never ☐

19 Do you feel that the ICT training you have received has adequately prepared you for using ICT in your studies?

- Yes ☐
- No ☐
- Not sure ☐

20 What additional ICT training or support would you like to receive at school? Tick all that applies

- Advanced software skills ☐
- Coding or programming languages ☐
- Internet safety and cybersecurity ☐
- Other (please specify): _____

21 How effective do you find the ICT training at school?

Very effective ☐

Somewhat effective ☐

Not effective ☐

22 What challenges do you face in accessing ICT devices at school? Tick all that applies

- Lack of devices ☐

- Poor internet connectivity ☐

- Lack of technical support ☐

- Others (please specify): _____

23 What challenges do you face in using ICT for learning? Tick all that applies

Lack of training ☐

Complex technology ☐

Lack of access to relevant content ☐

Others (please specify): _____

24 Have you experienced any difficulties in using ICT devices in the classroom?

Yes ☐

No ☐

If yes, please specify the difficulties you have experienced.

25 Are there any measures or strategies in place at school to improve access to ICT devices?

- Yes ☐

- No ☐

If yes, please describe the measures or strategies in place.

26 Are there any measures or strategies in place at school to raise awareness of the benefits of using ICT for learning?

Yes ☐

No ☐

If yes, please describe the measures or strategies in place.

27 In your opinion, what strategies can be used to improve access to ICT devices at school? Tick all that applies

- Providing more devices ☐

- Upgrading internet connectivity ☐

- Providing technical support ☐

- Others (please specify): _____

28 How can the school improve awareness of the benefits of using ICT for learning? Tick all that applies

Organizing awareness campaigns ☐

Introducing ICT in more subjects ☐

Others (please specify): _____

29 What strategies do you think can enhance the use of ICT for learning among students?

Providing more interactive learning materials ☐

Encouraging collaborative projects using ICT ☐

Others (please specify): _____

Impact of ICT on Learning:

30 How do you think ICT has impacted your learning experience?

- Positive impact ☐
- No impact ☐
- Negative impact ☐

31 In what ways do you think ICT can further improve your learning experience?

32 Apart from schoolwork, what other activities do you use ICT devices for?

- Social media ☐
- Entertainment (e.g., games, videos) ☐
- Research ☐
- Others (please specify):

33 How much time do you spend on ICT devices outside of school on a typical day?

- Less than an hour ☐
- 1-2 hours ☐
- 2-4 hours ☐
- More than 4 hours ☐

34 Do you think ICT skills will be important for your future career?

- Yes ☐
- No ☐
- Not sure ☐

35 How do you plan to improve your ICT skills in the future?

- Self-learning ☐
- Formal education/training ☐
- Others (please specify): _____

36 Do you have any suggestions on how the school can better support your ICT learning needs?

37 Is there anything else you would like to share about your experience with ICT in education?

38 How satisfied are you with the current use of ICT in your education?

- Very satisfied ☐
- Somewhat satisfied ☐
- Neutral ☐
- Somewhat dissatisfied ☐
- Very dissatisfied ☐

39 How often do your teachers use ICT in the classroom for teaching?

- Daily ☐
- Weekly ☐
- Monthly ☐
- Rarely ☐
- Never ☐

40 In what ways do your teachers use ICT for teaching?

- Displaying multimedia presentations ☐
- Online research activities ☐
- Interactive learning platforms ☐
- Online assessments ☐
- Others (please specify):

41 How effective do you find the use of ICT by your teachers in enhancing your learning experience?

- Very effective ☐
- Somewhat effective ☐
- Not effective ☐

42 Do your teachers receive any training or support in using ICT for teaching?

Yes ☐

No ☐

43 If yes to the above, how would you rate the quality of the training or support provided to teachers?

Excellent ☐

Good ☐

Average ☐

Poor ☐

44 In your opinion, what additional ICT skills or training do you think your teachers need to improve their use of ICT in teaching?

45 How do you think the use of ICT by teachers could be further enhanced to benefit your learning?

Thank you for participating

Appendix 3: Interview Guide With Teachers

1. Can you describe the current availability of ICT devices (e.g., computers, laptops, tablets) at Finetown Secondary School?
2. How would you rate the accessibility of ICT infrastructure (e.g., internet connectivity, projectors, interactive whiteboards) at Finetown Secondary School?
3. What are the main challenges you face in accessing ICT resources at Finetown Secondary School?
4. How would you describe the level of awareness among teachers about the benefits of using ICT in teaching?
5. Have you received any training on how to effectively integrate ICT into teaching practices?
6. How effective do you think the training on using ICT for teaching has been?
7. How often do you use ICT (e.g., computers, projectors, educational software) in your teaching?
8. What types of ICT tools do you use most frequently in your teaching?
9. How do you think the use of ICT has impacted student engagement in the classroom?
10. In what ways do you think the use of ICT has improved student learning outcomes? What do you perceive as the main barriers to effectively using ICT in teaching at Finetown Secondary School?
11. Have you faced any technical issues (e.g., software compatibility, hardware malfunctions) while using ICT in your teaching? If yes, please describe.
12. How would you rate the overall impact of ICT use on teaching and learning at Finetown Secondary School?
13. Do you think the use of ICT has helped in personalizing learning for students? Please explain.
14. Do you feel supported by the school administration in your efforts to integrate ICT into your teaching?
15. What additional support or resources do you think teachers need to effectively use ICT in teaching?
16. How do you envision the role of ICT in teaching and learning evolving in the future at Finetown Secondary School?
17. What initiatives or changes would you like to see in the future regarding the use of ICT in teaching at Finetown Secondary School?

Appendix 4: Ethical Clearance Certificate



15 November 2024

Sindiswa Khumalo (216008452)
School of Social Sciences
Pietermaritzburg Campus

Dear S Khumalo,

Protocol reference number: HSSREC/00007759/2024

Project title: Access to, awareness and use of information communication technology to promote efficient teaching and learning in the classroom for grade 11 learners at Finetown Secondary School in Johannesburg
Degree: Masters

Approval Notification – Expedited Application

This letter serves to notify you that your application received on 27 September 2024 in connection with the above, was reviewed by the Humanities and Social Sciences Research Ethics Committee (HSSREC) and the protocol has been granted FULL APPROVAL.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

Incidents of adverse events and serious adverse events (AEs and SAEs) should be reported in writing to HSSREC, the study sponsors, and any regulatory authority (where appropriate), within 7 working days of the occurrence for local sites and 14 days for all other South African sites.

This approval is valid until 15 November 2025.

To ensure uninterrupted approval of this study beyond the approval expiry date, a progress report must be submitted to the Research Office on the appropriate form 2 - 3 months before the expiry date. A close-out report to be submitted when study is finished.

HSSREC is registered with the South African National Health Research Ethics Council (REC-040414-040).

Yours sincerely,



Professor Dipane Hlalele (Chair)
/nng

Humanities and Social Sciences Research Ethics Committee

Postal Address: Private Bag X54001, Durban, 4000, South Africa

Telephone: +27 (0)31 260 8350/4557/3587 Email: hssrec@ukzn.ac.za Website: <http://research.ukzn.ac.za/Research-Ethics>

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