Information and Communication Technology Integration in South African Adult Basic Education and Training: A Case of Two Community Learning Centres in Eastern Cape

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I declare that the study titled "Information and Communication Technology Integration in South African Adult Basic Education and Training: A Case of Two Community Learning Centres in Eastern Cape" is my own work, and all sources used have been acknowledged. I further declare that I submitted the study to originality checking software.

I further declare that I have not previously submitted this work, or part of it, for examination at UNISA for another qualification or at any other higher education institution.



16 September 2026

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Dedication

This work is dedicated to my family and my supervisor.

Acknowledgements

My sincere gratitude goes to all the people who made the study possible.

Abstract

Information and Communication Technology (ICT) holds significant potential to transform adult education by expanding access, enabling flexible learning, and supporting diverse learner needs. Yet, despite global policy commitments to digital inclusion, ICT integration in adult education remains uneven, particularly in under-resourced contexts. In South Africa, where historical inequalities continue to shape educational access, Adult Basic Education and Training (ABET) Community Learning Centres (CLCs) serve as critical second-chance learning spaces for disadvantaged adults but remain peripheral to national digital transformation agendas. This study investigated ICT integration in teaching and learning at two CLCs located in the Eastern Cape, South Africa, examining the availability and accessibility of ICT tools, the nature and frequency of ICT use, educators' perceptions of pedagogical value, and the availability and relevance of ICT-related professional development.

The study employed a qualitative, interpretivist, multiple-case study design. Data were collected through semi-structured interviews with 10 purposively selected participants: 4 adult educators, 4 adult learners, and 2 centre managers. Supplementary document analysis was used to examine selected national and sector policy and strategy documents and to contextualise the interview findings. Thematic analysis was used to identify patterns, while Activity Theory and Diffusion of Innovation Theory provided complementary lenses for interpreting ICT integration as both a systemic and an adoption-related process.

The findings revealed a fundamental contradiction: basic ICT infrastructure existed in the selected CLCs, yet its availability did not translate into meaningful pedagogical integration. Access was uneven, favouring ICT-related learning areas, while non-ICT areas remained underserved. ICT use was predominantly administrative and preparatory, focusing on lesson preparation, printing, and administrative tasks rather than sustained classroom integration. Participants perceived ICT as valuable for learner engagement, visualisation and conceptual understanding; however, these perceived benefits were constrained by unreliable infrastructure, restricted access, inadequate pedagogical training and weak institutional support.

The study developed three empirically grounded conceptual contributions: conditional presence, referring to ICT infrastructure that is physically present but pedagogically constrained by institutional rules or infrastructure failures; hidden privatisation, referring to the informal transfer of ICT costs from institutions to educators through reliance on personal devices and data; and the pedagogical-digital divide, referring to the gap between basic digital

access and educators' capacity to use ICT meaningfully for teaching and learning. These concepts extend discussion of the digital divide by foregrounding the pedagogical and institutional conditions under which technology becomes educationally useful.

The study concludes that ICT integration in ABET is a systemic challenge that requires alignment among infrastructure, institutional rules, professional development, and educator support. It recommends a CET-specific ICT policy, equitable access frameworks, ongoing pedagogical training, dedicated maintenance budgets, and stronger accountability mechanisms, offering both empirical evidence from an under-researched context and a diagnostic framework for understanding ICT integration failures in under-resourced adult education settings.

Keywords

Information and Communication Technology, Adult Basic Education and Training, Community Learning Centre, pedagogical-digital divide, Activity Theory, Diffusion of Innovation.

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List of Abbreviations

Abbreviation	Full Meaning
ABET	Adult Basic Education and Training
ACET	Adult and Community Education and Training
AT	Activity Theory
CLC	Community Learning Centre
CLCs	Community Learning Centres
CET	Community Education and Training
DBE	Department of Basic Education
DCDT	Department of Communications and Digital Technologies
DHET	Department of Higher Education and Training
DOI	Diffusion of Innovations
ETDP SETA	Education, Training and Development Practices Sector Education and Training Authority
ICT	Information and Communication Technology
IT	Information Technology
LMS	Learning Management System
NDP	National Development Plan
NGO	Non-Governmental Organisation
PD	Professional Development
SETA	Sector Education and Training Authority
TVET	Technical and Vocational Education and Training
UNESCO	United Nations Educational, Scientific and Cultural Organization
VLE	Virtual Learning Environment
Wi-Fi	Wireless Fidelity
4IR	Fourth Industrial Revolution

CHAPTER ONE: INTRODUCTION

1.1 Introduction

Information and Communication Technology (ICT) has become significant in contemporary teaching and learning because it can expand access to information, support flexible learning and strengthen interaction between educators and learners. In South Africa, the National Digital and Future Skills Strategy identifies digital literacy as important for learning, work and social participation (Department of Communications and Digital Technologies [DCDT], 2020). Within the post-school system, Adult Basic Education and Training (ABET) is delivered through Community Learning Centres (CLCs), which form part of the Community Education and Training (CET) sector under the Department of Higher Education and Training (DHET). This institutional location is important because CLCs differ from schools administered by the Department of Basic Education in their mandates, learner profiles, staffing arrangements, funding environments and community-based functions.

ABET and the broader CET sector provide second-chance and lifelong-learning opportunities to adults and out-of-school youth through literacy, numeracy, communication, vocational and life-skills learning. Adult education is therefore not simply compensatory schooling; it can create transformative spaces in which marginalised learners rebuild educational participation and pursue further learning and livelihood opportunities (Daniels, 2020). Because adult learners bring prior experiences, practical goals and diverse levels of educational and digital familiarity, ICT integration in CLCs must be considered through an adult-learning lens rather than assumed to operate in the same way as technology use in primary or secondary schools (Akintolu and Letseka, 2021; Sasere and Makhasane, 2023).

Digital inequality remains a significant concern across South African education, particularly in under-resourced and rural communities where infrastructure, connectivity costs and institutional capacity can constrain participation (Aruleba and Jere, 2022). Although school-based research is useful for identifying broad patterns, it cannot be transferred uncritically to CLCs because adult learning occurs within a distinct post-school, community-based institutional setting. The present study therefore focused specifically on the ways in which infrastructure, access arrangements, educator capability and institutional support shape ICT integration within CLC teaching and learning.

Recent South African studies show that the presence of technology does not by itself produce meaningful educational use. Mnisi, Mtshali and Makgato (2024) identify continuing challenges

in moving from technology provision to integration, while Abel, Tondeur and Sang (2022) emphasise the importance of educators' perceptions and capability. These concerns are particularly salient in adult education, where learners may have uneven prior exposure to digital technologies and where CLCs operate with variable resources and institutional support.

The study was theoretically informed by Activity Theory and Diffusion of Innovation Theory. At this introductory stage, the theories are identified only to signal that ICT integration was examined as both a systemic institutional process and an educator-adoption process; their concepts, strengths, limitations and complementary analytical value are developed fully in Chapter 2.

The global COVID-19 pandemic exposed and intensified longstanding inequalities in digital preparedness across education systems. In South Africa, emergency shifts towards technology-mediated learning highlighted uneven access to devices, connectivity and digital capability, while also reinforcing the need for context-sensitive approaches to digital education (Mhlanga and Moloi, 2020; Shava, 2022). These pressures were especially relevant to adult education because many adult learners rely on community-based provision and may have limited access to digital resources outside the learning centre (Ditlhale and van den Berg, 2024).

ICTs in ABET thus become a concern, both educational and social justice-related. The CLCs were given the responsibility to encourage lifelong learning and social engagement, but achieving this objective becomes more difficult because learners and educators do not have automatic access to technology. Apart from the above points, the ETDP SETA survey on Adult and Community Education and Training Colleges (2021) indicates that more focus is needed on these sub-sectors for adults. Moreover, according to Nchabeleng (2024), challenges associated with the digitalisation of the learning process in the community affect both learners and educators. Therefore, this research examined the extent to which ICT was integrated into teaching and learning in the two selected CLCs in the Eastern Cape, South Africa.

1.2 Background to the Study

Globally, digital technologies have become increasingly important to lifelong learning, access to information and participation in knowledge-based economies. International policy frameworks such as the UNESCO ICT Competency Framework for Teachers emphasise that the educational value of technology depends not only on devices but also on educator competence, pedagogy and supportive institutional conditions (UNESCO, 2018). This broader international context provides the first level of the study's background.

The research background centres on the growing need for digital inclusion in education and training, particularly in South Africa's schooling system. The notion of digital literacy is regarded as an important aspect of labour market participation and involvement in the knowledge economy at the national level. Nevertheless, the field of adult education does not appear to be a focus of attention compared to the schooling system, tertiary educational institutions, and TVET colleges. As pointed out by Ramnarain and Ndlovu (2023), the deployment of ICT in the educational sphere in Africa should be assessed with the prevailing disparities in infrastructure, resources, and educator preparedness in mind. More precisely, educators in adult education would need some training in the use of ICT.

It is important that CLCs lead in the adult education field, as these centres provide adult learners with an opportunity to learn despite their inability to succeed in formal education. The centres serve the needs of people from varied backgrounds, ranging from basic skills in reading and arithmetic to vocational and future education programs. Unfortunately, the centres lack enough funding and learning materials to enable learners to achieve their learning goals. According to Daniels (2020), adult education will be transformative only if it helps to address the social and educational exclusion of learners. Information and Communication Technologies may play an important role in the transformation by expanding access to learning materials and adopting more practical teaching methods. Nevertheless, this will only happen if digital tools are readily available and relevant to the pedagogical needs of the adult learners.

Furthermore, another issue to consider is that the integration of ICT in the classroom cannot be assessed simply by whether it has been integrated. According to the researchers discussed by Abel et al. (2022), any form of ICT integration will necessarily involve consideration of the educator's perspective, as well as the educator's actual integration into the classroom. Consistent with this notion, as Rana (2023) suggests, ICT training will be effective when the connection between ICT and the educator's environment is established. It can therefore be seen that, in terms of ABET, ICT training is not all-encompassing but rather focuses on the application of ICT in planning, engaging, assessing, and differentiating.

This research is thus situated at the juncture between access to ICT, adult education, educator development and institutional structures. This research recognises that the integration of ICT in CLCs

involves many interdependent variables, including infrastructure, policies, educators' ability to effectively use technology, learners' readiness, and centre management. An advantage of

using the theoretical perspective known as Activity Theory is that it allows analysis of all variables in relation to a single activity system, rather than addressing each problem independently. Also, it should be noted that the perceived usefulness, manageability, and compatibility of ICT with adult teaching methods affect technology adoption.

1.3 Problem statement

National policy increasingly positions digital capability as necessary for participation in education, employment and society (DCDT, 2020). However, the existence of national digital priorities does not establish whether ICT is meaningfully integrated within Community Learning Centres. The central problem addressed in this study was therefore the gap between the policy expectation of digital inclusion and the conditions under which adult educators and learners actually access and use ICT in CLC teaching and learning.

The first dimension of the problem concerned infrastructure and access. ICT resources may be present but remain insufficient, unreliable, shared, restricted or poorly maintained. In such circumstances, physical availability does not necessarily produce pedagogical availability. This distinction required the study to examine not only what tools existed, but also whether they were functional, accessible across learning areas and available when educators and learners needed them.

The second dimension concerned instructional capability and institutional support. Educators may have access to devices yet lack pedagogically focused professional development, subject-specific guidance or organisational support for integrating technology into adult learning. These capability constraints are analytically different from infrastructure shortages and therefore needed to be examined separately rather than treated as one operational problem (Holler, Brändle and Zinn, 2023; Nchabeleng, 2024).

An empirical gap remained because relatively little research had examined these infrastructure and pedagogical dimensions simultaneously from the perspectives of adult educators, adult learners and centre managers within the same CLC settings. The study addressed this gap through a qualitative multiple-case inquiry into two Eastern Cape CLCs, focusing on ICT availability and access, patterns of use, perceived pedagogical value, and ICT-related professional development and institutional support.

1.4 Aim of the study

The research aimed to explore the current state of the integration of Information and Communication Technology (ICT) into teaching and learning at two CLCs in South Africa. The areas of concern will include what ICT tools are currently available at these centres, the frequency of ICT usage, the types of ICT used in teaching and learning, perceptions about the pedagogical value of ICTs, and the availability of ICT-related professional development - its relevance and the frequency with which educators benefit from these offerings. In general, CLCs are key players in adult learning and education, offering opportunities in their communities, especially to adults who have not had access to such education before.

Activity Theory and Diffusion of Innovation Theory were used as complementary analytical lenses. Activity Theory supported analysis of systemic relationships and contradictions among tools, rules, roles, community and educational objectives, while Diffusion of Innovation Theory supported analysis of educators' perceptions of relative advantage, compatibility, complexity, trialability and observability (Engeström, 2001; Rogers, 2003).

Combining the two theories provided a specific analytical advantage for an under-resourced adult-learning context: it connected institutional conditions that enable or constrain ICT use with the perceptions that influence whether educators adopt and sustain ICT-supported practices. This complementary use of the theories is developed in Chapter 2 and applied to the findings in Chapter 5.

1.5 Research Objectives

The objectives of the study were to:

1. Understand ICT tools available and accessible to adult educators and learners across the two selected CLCs.
2. Analyse the frequency, forms and extent of ICT integration in teaching and learning practices across the two selected CLCs.
3. Evaluate adult educators' perceptions of the pedagogical value and limitations of ICT integration for adult teaching and learning.
4. Examine the availability, relevance and frequency of ICT-related professional development and institutional support for adult educators in the two selected CLCs.

1.6 Research Questions

1.6.1 Main Research Question

What is the current status of ICT integration in teaching and learning at two Community Learning Centres in the Eastern Cape, South Africa?

1.6.2 Sub-Research Questions

1. What types of ICT tools are currently available and accessible to adult educators in CLCs?
2. How frequently, in what ways, and to what extent do adult educators integrate ICT into teaching and learning practices within CLCs?
3. What are adult educators' perceptions of the pedagogical value and effectiveness of ICT integration in enhancing teaching and learning outcomes?
4. What ICT-related professional development opportunities are available to adult educators in ABET, and how relevant and frequent are these opportunities?

1.7 Rationale of the study

The rationale for the study arose from the importance of equitable digital participation within adult and community education. CLCs provide second-chance and lifelong-learning opportunities to adults whose access to formal education, employment and digital resources may already be constrained. National digital policy therefore has limited value for this sector if technology is physically present but inaccessible, unreliable or pedagogically underused (DCDT, 2020; DHET, 2013).

The study was also warranted by the limited CLC-specific evidence on how infrastructure constraints and educator capability interact in day-to-day teaching and learning. Existing South African research has documented digital inequalities and educator challenges in schools, higher education and TVET contexts, while research focused directly on community education remains comparatively limited (Land, 2021; Nchabeleng, 2024; Maceke, 2025). A multi-stakeholder case study was therefore needed to examine the experiences of educators, learners and centre managers within the same institutional settings.

The theoretical rationale lay in combining Activity Theory with Diffusion of Innovation Theory. Activity Theory enabled examination of contradictions among ICT tools, institutional rules, support arrangements and the object of teaching and learning; Diffusion of Innovation Theory enabled examination of adoption-related perceptions such as relative advantage,

compatibility and complexity. Used together, the frameworks connected systemic conditions with individual adoption dynamics and were therefore suited to analysing ICT integration in under-resourced adult-learning environments.

1.8 Significance of the study

This study contributes to knowledge on ICT integration in South African Adult Basic Education and Training by focusing specifically on Community Learning Centres within the CET sector. It provides comparative evidence from two Eastern Cape CLCs and demonstrates why ICT access should be distinguished from meaningful pedagogical use. The study also contributes conceptually through the notions of conditional presence, hidden privatisation and the pedagogical-digital divide, while offering practical implications for CET policy, centre management and educator professional development.

The theoretical contributions include the application of Activity Theory and Diffusion of Innovation Theory to the investigation into ICT integration at CLCs. Activity Theory was useful because it demonstrated that ICT integration could not be understood only as an educator's personal decision, but as a systemic process shaped by tools, rules, community, division of labour and the object of enhancing adult learning. Furthermore, the Diffusion of Innovation Theory can help to explain why different educators decide to integrate ICT differently due to its perceived usefulness, compatibility with their practice, manageability, observability, and trialability. Pedagogical-Digital Divide concept was also contributed as part of the study. It denotes the division between mere digital access or ICT operational proficiency and actual ICT use that serves as a tool for adults' education and training.

In conclusion, the results obtained through the study have relevance to policy makers, CLC managers, adult educators and professional development institutions. Policy makers may find the results useful in the formulation of ABET specific ICT policies regarding issues such as ICT infrastructure, ICT funding, ICT maintenance, equal access and training of ABET educators in using ICT tools. CLC managers may also be able to derive something from this study because they can learn about the importance of having scheduled ICT access arrangements at classroom level, institutional ICT support systems and even accountability mechanisms for ICT use in classrooms. Adult educators may find this research's result relevant in terms of professional development which should not only be limited to computer training but also lesson planning, learner motivation, visualisation, evaluation and adult education needs.

It is also worth mentioning that this study is part of the broader conversation on digital inclusivity and lifelong learning in South Africa. It should be acknowledged that learners who enrol in ABET courses are socio-educationally disadvantaged in many ways. According to Land (2021), the context in which adult educators work in community colleges influences their training and working conditions. Besides, it should be noted that, according to Maceke (2025), there exist some barriers that hinder the process of educating adults in CLCs. Investigating the barriers and facilitators that interfere with ICT adoption in two CLCs can help gather information necessary for applying the appropriate strategies. What is especially noteworthy about the findings described in this study is that the recommendations are practical, as various time frames have been considered for implementation.

1.9 Scope and Delimitations of the Study

The study was delimited to two public Community Learning Centres in the Eastern Cape that operate within the CET sector. The centres were anonymised as Centre A and Centre B in the empirical chapters. The inquiry focused on four bounded dimensions of ICT integration: availability and accessibility of ICT tools; patterns and extent of use in teaching and learning; educators' perceptions of pedagogical value; and ICT-related professional development and institutional support. The study did not seek to measure causal effects of ICT on examination scores, nor to generalise statistically to all South African CLCs.

1.10 Limitations of the Study

The study's limitations included the small purposive sample, reliance primarily on self-reported interview accounts, the absence of classroom observation and the absence of pre- and post-intervention measures of learner performance. These limitations restrict statistical generalisation and direct verification of classroom practice. They were mitigated through cross-case comparison, inclusion of three stakeholder groups, member checking, an audit trail, reflexive practice and supplementary document analysis. The implications of these limitations are discussed fully in Section 6.7.

1.11 Outline of the Dissertation Chapters (Chapter 1 to Chapter 6)

This dissertation is structured into six chapters. Each chapter is designed to build logically towards answering the main research question on the status of ICT integration in teaching and learning at two CLCs in South Africa, with specific reference to ICT access, usage, pedagogical value, and educator professional development within the ABET context.

Chapter 1: Introduction

In Chapter 1, which provides an overview of the research, the background of the use of Information and Communications Technology (ICT) in education is discussed, especially in relation to CLCs in South Africa. The topic of the research, research question, aims, objectives, and rationale for conducting the study are outlined. This Chapter highlights the role of ICT use in achieving the country's priorities for equality and ICT empowerment as well as theoretical approaches underpinning the research.

Chapter 2: Literature Review

Chapter 2 is an important discussion of previous literature relevant to this study. It addresses ABET in South Africa from the perspectives of its evolution, policies, and challenges facing the successful implementation thereof. It considers the definitions and trends related to the integration of ICT, as well as their integration in the case of South Africa. Furthermore, this chapter considers the ICT that are available to adult educators within CLCs in South Africa. It goes on to address educator competence, professional development, pedagogical importance of ICT in adult learning, and the digital divide challenge. This chapter concludes by highlighting gaps in the research on ICT in CLCs, thus emphasising the importance of this research.

Chapter 3: Research Design and Methodology

This chapter highlights the methodology employed in exploring ICT integration in the two selected CLCs. The chapter outlines the research approach adopted which involves the interpretive qualitative research methodology and provides the design (case study). The participant-selection procedure, the data collected and the data-collection procedures are described in this chapter. The chapter also explains thematic data analysis and the strategies used to support credibility, dependability, transferability and confirmability.

Chapter 4: Data Analysis and Presentation of Findings

Chapter 4 presents the empirical findings of the study in a systematic and thematically organised manner. The chapter is structured according to the study's research questions and objectives, focusing on the availability and accessibility of ICT tools, the frequency and forms of ICT integration into teaching and learning, educators' perceptions of the pedagogical value of ICT, and the nature and adequacy of ICT-related professional development opportunities. The chapter presents patterns across stakeholder responses, including adult educators, adult

learners and centre managers, using themes supported by participant evidence. While the chapter remains primarily descriptive and evidence-based, it includes limited preliminary analytical observations to highlight patterns, tensions and contradictions emerging from the data. However, detailed theoretical interpretation using Activity Theory and Diffusion of Innovation Theory is reserved for Chapter 5.

Chapter 5: Discussion of Findings

The fifth chapter is an interpretation of the findings in light of the theories and literature that have informed the study. The chapter explores the way in which the findings relate to previous research conducted on the issue of integrating information and communication technologies in adult education programmes. The findings are interpreted using the theory of activity system advanced by Engeström (2001). Some of the key aspects of the activity systems approach include systems factors, contradictions, mediating artefacts, institutional norms, division of labour, and the context.

Chapter 6: Conclusions and Recommendations

The sixth chapter of this dissertation serves as the conclusion and presents a summary of the results in relation to the research questions and objectives raised in the study. It includes general conclusions about the current situation pertaining to ICT integration in the two CLCs. Moreover, it highlights the factors that enable and constrain ICT integration in the CLCs. The chapter also discusses recommendations based on the results obtained through the study, which pertain to the enhancement of ICT infrastructure, access to ICTs, educator competence, professional development, and institutional support for the sustainable integration of ICTs in ABET.

1.12 Definition of Key Concepts

Adult Basic Education and Training

Adult Basic Education and Training is defined as an organised form of learning which is conducted for adults and youth that have not attended formal education or need basic literacy and numeracy training. This research considers ABET as a learning programme organised for adults in CLCs and how ICT plays a role in such adult education programmes (Daniels, 2020).

Adult Learner

An adult learner is defined as an individual who is registered under an adult education programme in a CLC. As per this research work, adult learners include those who are pursuing programmes in ABET Level 4, Information and Communication Technology related subjects or skills-based programmes in the chosen centres. The definition acknowledges that adult learners are likely to have different backgrounds as well as diverse educational requirements (Akintolu and Letseka, 2021).

Adult Educator

In this study, the term adult educator refers to the practitioner responsible for facilitating or teaching ABET/CET learning programmes at the selected CLCs. The term is used consistently because it reflects the study's participant category, while recognising that related institutional contexts may also use designations such as facilitator, tutor or lecturer.

Community Learning Centre

A Community Learning Centre is a place that provides adult education and training programmes within communities, particularly targeting adults and youth who are not in school and who need basic education and skill development. The acronym CLC used in this work represents the two selected adult education centres in South Africa where the study was carried out. Such centres are known to provide community-based learning venues aimed at enhancing adult learning and education in line with community needs (Belete et al., 2022).

Information and Communication Technology

The term Information and Communication Technology can be defined as the application of electronic machinery, technology, techniques, and systems used in information generation, storage, processing, communication, and utilisation. In this case, ICT includes such electronic equipment used in education, including computers, laptops, projectors, printers, internet, smartphones, interactive whiteboards, educational software, and others. It has been defined broadly because ICT in education includes not only the physical equipment used in learning and teaching but also the digital environment where the instructional communication takes place (Kilag et al., 2023).

ICT Integration

ICT integration can be explained as the intentional use of ICT in order to facilitate, enhance, or transform the teaching-learning experience. As regards the present study, ICT integration refers not only to the presence of ICT in CLCs but also to the ways in which they are used in classes, during lesson preparation and evaluation, as well as in educator training. This point is essential since ICT integration involves the pedagogical use of ICT, rather than mere availability thereof (Kafu-Quvane, 2021).

Digital Divide

Digital divide is an imbalance in relation to the use and access to ICT and the service offered. In this study, digital divide refers to the difference or inequality in relation to the use and access to ICT and the internet for adult educators and learners in CLCs. Digital divide, in this study, indicates the social, economic, and technological barriers to the involvement of ABET educators and learners in ICT-based education (Aruleba and Jere, 2022).

Pedagogical-Digital Divide

The concept can be applied to the discrepancy that is evident regarding the difference between availability of basic digital competence and the utilisation of such technology in education. In this study, the concept refers to the discrepancy between operational digital skills and the meaningful use of ICT in lesson planning, learner engagement, assessment and the delivery of information. Its relevance lies in recognising that education in a technological era requires more than digital competence; it requires digital pedagogy (Strydom, Wessels and Anley, 2021).

Professional Development

Professional development is associated with the formal or informal training programmes that are intended to improve the educational knowledge and skills of the educators. ICT-supported professional development is referred to the formal or informal training programmes in which the educators receive education on how to apply ICT in their educational practices. The concept is very significant in understanding digital competence, ICT application in the classroom, and sustainable ICT use by educators (Nyathi and Joseph, 2024).

Activity Theory

Activity Theory is a theoretical framework used to analyse human activity as a system shaped by interactions between subjects, tools, objects, rules, community and division of labour. In

this study, Activity Theory is used to examine how ICT integration in CLCs is influenced by the relationships among educators, ICT tools, institutional rules, support structures, and teaching objectives. The framework is useful because it allows the study to identify systemic contradictions that constrain ICT use in ABET teaching and learning (Engeström, 2001).

Diffusion of Innovation Theory

Diffusion of Innovation Theory explains how new ideas, practices or technologies are adopted within a social system. In this study, the theory is used to understand how adult educators adopt or resist ICT integration based on perceived relative advantage, compatibility, complexity, trialability and observability. The theory is relevant because ICT adoption in ABET depends not only on access to technology but also on educators' perceptions of its usefulness, practicality, and fit with adult teaching contexts (Rogers, 2003).

Lifelong Learning

Learning for life refers to the learning process that is undertaken throughout one’s lifetime for developmental purposes, such as: socially, educationally, and economically, among others. Concerning this research paper, lifelong learning can be tied to the issue of ABET since CLCs offer an opportunity for adult learners to enhance their knowledge, skills, and involvement in socio-economic activities. The concept of lifelong learning is pertinent to this research since it can aid the process of continuous learning for people who have had a second chance in their education or skill acquisition (Belete et al., 2022).

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature on ICT integration in adult education, with specific attention to ABET and Community Learning Centres in South Africa. The review moves from the post-school adult-education context to ICT access, integration, pedagogical value, professional development and the digital divide. It also critically examines the extent to which evidence derived from school, higher-education and TVET contexts can be transferred to adult and community education.

The review follows the study's four areas of inquiry: ICT availability and accessibility; the frequency and forms of ICT use; pedagogical value in adult learning; and professional development and institutional support. Each major section begins with a short orienting statement before its subsections, and the discussion gives priority to evidence from adult education, CET and related post-school settings while using school-based studies only where they provide a clearly identified contextual comparison.

The theoretical framework combines Activity Theory and Diffusion of Innovation Theory. The chapter examines the origins, core constructs, strengths and limitations of each theory and explains their complementary value for analysing systemic contradictions and adoption dynamics in CLCs. This approach prevents ICT integration from being treated as a purely technical event and instead situates technology within institutional rules, educator agency, learner needs and organisational support.

2.2 Overview of Adult Basic Education and Training (ABET) in South Africa

2.2.1 The Historical Context of ABET

ABET originated in South Africa in an atmosphere of exclusion and discrimination. The education institutions were more concerned with disfranchisement than with adult education during the apartheid regime (Meladi and Awolusi, 2020). Lack of proper education had caused people to become poor and unemployed; hence, there was a need for transformational adult education after the end of apartheid in 1994 (Mnisi, Mtshali and Makgato, 2024). ABET taught adults: literacy, numeracy, and life skills to address historical imbalances after apartheid (Munje and Jita, 2020). These programmes encouraged adults to participate in nation-building and socioeconomic activities.

ABET activities were done in underprivileged urban and rural areas through CLCs (Aruleba and Jere, 2022). Learning materials were provided from these centres with an aim of providing customised guidance in available centres. Lack of a standard curriculum and facilitators has posed challenges in ABET at its early stage of implementation. Even though ABET was influenced by global trends of lifelong learning, there was a need for customised ABET programmes for South Africa (Shava, 2022). Adoption of ICT in education has led to ABET programmes being updated.

Despite ABET achieving positive results, the structural inequalities associated with the apartheid regime makes ABET very difficult to be implemented effectively. Adoption of ICT by ABET programme has been very useful in addressing educational inequalities (Shobande and Asongu, 2022). Distribution of educational resources has always been the major constraint of ABET programmes.

2.2.2 ABET Policy Framework and Regulations

Equity, diversity, and accessibility are some of the goals that the government is trying to realise through ABET programmes in South Africa. According to the White Paper on Post-School Education and Training (2013), ABET plays an important part in helping and achieving skill formation and socio-economic development (Ngcapu, Simelane-Mnisi, and Mji, 2022). It is recommended by the White Paper that adult education should occur in CLCs. In order to alleviate poverty in the country, the National Development Plan 2030 calls for the use of ICT in the whole process of education.

Nevertheless, not all CLCs are well-equipped with adequate financial capacity and infrastructure that would facilitate the adoption of progressive policies. One of the problems with ICT adoption in ABET in South Africa is related to inadequate resources allocation, which is caused by laws passed by the government (Adelabu et al., 2022). Inadequate internet connectivity has been identified as one of the limitations for the adoption of ICT in rural CLCs (Munje and Jita, 2020). The evaluation process of the established goals of the policy has not facilitated a cohesive effort in adopting ICT in CLCs (Shava, 2022). ICT practice and policy implementation in ABET will address the aforementioned issues.

Firstly, the policy should consider the resource limitations and training of educators in the field of ICT. The White Paper on Post-School Education and Training (2013) stresses that adult educators need to improve their capabilities to use ICT (Mnisi, Mtshali and Makgato, 2024). It

is impossible to use ICT effectively without proper training (Shobande and Asongu, 2022). It is necessary for the ABET policy to strive for creating ICT-friendly environment by providing the relevant training.

2.2.3 Challenges Facing ABET in South Africa

There is a lack of adequate infrastructure that would enable the integration of ICT in CLCs in South Africa because these centres lack ICT such as computers, internet connectivity and even electricity (Meladi and Awolusi, 2020). These centres lack financial support to purchase modern equipment in order to be able to integrate ICT (Mnisi, Mtshali and Makgato, 2024). Older methods of teaching are employed in rural CLCs due to lack of financial and other forms of support. The use of ICT to enhance learning and teaching becomes challenging in this case.

The shortage of ICT-capable instructors constitutes the second problem. Despite ICT training that is provided to educators by the authority, the majority of adults are not ICT literate enough to utilise ICT technology in their teaching practices (Ngcapu, Simelane-Mnisi and Mji, 2022). Lack of professional development courses aimed at improving the ICT skills among ABET educators makes the situation worse (Shava, 2022). ICT instruction is required by educators to increase participation and improve performance of learners (Aruleba and Jere, 2022). ICT training is essential for ABET instructors.

There are other disparities and digital divide issues that arise regarding the application of ICT in the ABET curriculum. For example, the matter of economic disparity arises because the poor learners and educators cannot access digital resources (Shobande and Asongu, 2022). The use of ICT in rural areas encounters problems due to infrastructure problems and financial issues (Munje and Jita, 2020). It is important to note that there is a need to improve on the ABET programme by ensuring the development of ICT.

A critical implication for this study is that ICT cannot be evaluated solely in terms of technical efficiency. Adult learners may value technology when it supports autonomy, practical relevance and problem-centred learning, but technology can also reproduce exclusion when it assumes prior digital access or confidence. Selwyn (2017) cautions against technologically deterministic accounts of educational change; this supports the study's focus on the social, institutional and pedagogical conditions that determine whether ICT becomes educationally meaningful.

Transformative learning theory further emphasises that adult learning can involve critical reflection on prior assumptions and the reinterpretation of experience (Mezirow, 1991). In CLCs, ICT can potentially support exposure to new perspectives, visual representations and problem-solving resources; however, its value depends on whether educators mediate those resources in ways that connect with adult learners' experiences. Jarvis (2006) similarly positions adult learning as situated within social experience, reinforcing the need to interpret technology use within the learners' broader life and institutional contexts.

Principles of andragogy emphasise adults' prior experience, self-direction, readiness to learn and preference for learning that is relevant to immediate life or work needs (Knowles et al., 2020). These principles are pertinent to ICT integration because the usefulness of a digital tool depends on whether it supports meaningful adult-learning tasks rather than merely introducing technology for its own sake. South African adult-learning scholarship similarly stresses the need to connect ICT capability with adult pedagogy and context (Akintolu and Letseka, 2021; Sasere and Makhasane, 2023).

2.3 Information and Communication Technology in Education

2.3.1 Definition and Scope of ICT in Education

ICT encompasses tools for creation, storage, exchange, and management of information. There are applications such as educational applications, LMS, and collaboration software together with PCs, tablets, projectors, and cellular phones (Meladi and Awolusi, 2020). Learning has become interactive, engaging, and centred on the learner through the application of ICT. Technology makes it possible for digital platforms to customise classes for different types of learners (Abel, Tondeur and Sang, 2022). Tracking learning performance, carrying out virtual assessment, and making decisions based on the data away from class become easier due to ICT (Shobande and Asongu, 2022). Marginalised learners have access to improved educational content due to ICT (Mnisi, Mtshali and Makgato, 2024). It supports adult education in ABET to bridge the literacy gap.

The application of ICT in education is not limited to teaching, but it goes beyond into other sectors like administration, professional development, and lifelong learning. Attendance monitoring, and performance dashboards enable the educator to become familiar with the progress made by the learners so that they can intervene in case it becomes necessary (Kilag et al., 2023). The application of ICT in education enables educators to improve on their

professional practice as they acquire digital literacy skills (Shava, 2022). Adults gain computing skills through ICT via ABET programmes (Aruleba and Jere, 2022).

There are limitations posed by the application of ICT in the teaching-learning process, particularly ABET, due to the significant impact of ICT in educational change. Such limitations can be factors such as the digital divide, disparities in resource availability, as well as difficulties with infrastructure that might hinder the application of ICT by both educators and learners (Meladi and Awolusi, 2020). Innovation within technology requires continuous upgrading and updating of technology which might require high costs from educational institutions (Mnisi, Mtshali and Makgato, 2024). There are numerous advantages of ICT in education. ICT is able to help reduce educational disparities within ABET in South Africa.

2.3.2 Global Trends in ICT Integration in Adult Education

The use of ICT in enhancing access and quality learning for adult education programmes has been realised in various parts of the world by virtue of the efforts put by governments, development organisations, and even educational institutions. Developed countries such as the United States and Finland have adopted virtual classroom facilities, e-learning and the adoption of artificial intelligence learning analytics to create flexible learning environments (Shobande and Asongu, 2022). Flexible learning facilitates learning that is self-paced and customised (Adelabu et al., 2022). Virtual Learning Environment creates room for learner-instructor interaction which facilitates globalisation of learning processes (Abel et al., 2022).

Education equality and socioeconomic development programmes have brought about greater utilisation of ICT in adult education in developing countries. The ICT based learning initiative called PMGDISHA is empowering rural areas in India through ICT (Shava, 2022). The Digital Literacy Program implemented by the Kenyan government seeks to teach adults on the use of online governmental services and jobs (Adelabu et al., 2022). These examples show how ICT can be used in promoting education equality and reducing disparities among disadvantaged people. ICT education programmes experience problems such as lack of internet access, cost of ICT devices and inadequate ICT literacy among educators (Mnisi, Mtshali and Makgato, 2024).

There are some global trends which depict how ICT can be used in policy interventions and collaborations with stakeholders. Some governments have policies which incorporate ICT in education and economy through funding, development of necessary infrastructure and capacity

building initiatives (Ngcapu, Simelane-Mnisi and Mji, 2022). Collaboration between different stakeholders increases resource mobilisation and information exchange (Shobande and Asongu, 2022). These global examples give South Africa an idea on how ICT could help transform adult education in South Africa. ICT can facilitate learning and socioeconomic development in adult basic and further education training.

2.3.3 ICT in the South African Educational Context

ICT is fundamental for the achievement of equal opportunities in learning and education in South Africa. The government policy documents like the National Development Plan 2030 and e-Education White Paper call for the use of ICT in education at all levels of learning, including ABET (Meladi and Awolusi, 2020). This strategy uses ICT in creating educational opportunities in rural and disadvantaged areas due to deficiencies in infrastructure and resources (Shava, 2022). Different strategies have been used to adopt ICT in urban and rural South African schools and CLCs (Ngcapu, Simelane-Mnisi and Mji, 2022). Rural CLCs face challenges with internet connectivity, old technology and the lack of qualified educators (Aruleba and Jere, 2022).

Though fraught with challenges, the ICT in Education Initiative in the Department of Basic Education focused on ICT usage in the education process. Such processes include the creation of online learning platforms, digitisation of the textbook, and training of educators to become ICT literate (Mnisi, Mtshali and Makgato, 2024). Adoption of ICT in CLCs and marginalised schools has been done through PPP (Adelabu et al., 2022). However, owing to the digital divide, ICT will not be equally adopted in South Africa. The socioeconomic difference, inadequate funding and ineffective policies have caused the poor (learners and educators) to lack ICT (Shobande and Asongu, 2022).

By adopting ICT in their education journey through ABET, learners will benefit from their access to ICT as they will be doing self-study from various sources and acquiring necessary skills from ABET's ICT. For ICT to fully deliver its potential benefits, the holistic adoption will have to be carried out. That is, correcting deficiencies and maximising strengths. ICT can be used optimally in ABET by developing ICT infrastructure, capacity building among educators and working with corporations (Ngcapu, Simelane-Mnisi and Mji, 2022). ICT initiatives targeting socio-economic developments will go a long way in promoting education in South Africa.

2.4 ICT Tools Accessible to Adult Educators in ABET

This section examines the kinds of ICT tools available to adult educators, the conditions governing access to those tools and the barriers that affect their use in CLCs.

2.4.1 Types of ICT Tools

The equipment and software related to ICT can assist ABET educators to enhance their instruction and learning experience. The access and distribution of the instructional content through digital means take place mostly through desktops, laptops, tablets, and smartphones (Meladi and Awolusi, 2020). Through the utilisation of Microsoft Office Suite software, educators are able to create, edit and distribute instructional content on their computers and laptops while through tablets and smartphones, they have access to the digital content wherever they go (Adelabu et al., 2022). Projectors and interactive whiteboards enable educators to make use of video clips and animations to explain concepts to the learners (Shava, 2022).

Both Moodle and Blackboard have been employed in organising and managing educational content, monitoring progress of the learners, and increasing interaction between educators and learners (Abel, Tondeur and Sang, 2022). Blended learning through face-to-face and virtual modes of learning works efficiently when ABET learners miss classroom activities due to work or other engagements (Yalley, 2022). Gamification techniques are applied by both Kahoot and Quizlet to make learning fun and interesting (Mnisi, Mtshali and Makgato, 2024). Both Zoom and Microsoft Teams are some of the virtual learning tools that help educators connect with their learners who learn at home or from distant places. Canva and Adobe Spark are some of the online tools that educators can utilise in developing tailor-made educational materials in order to facilitate learning among adults (Shobande and Asongu, 2022).

ICT play an important role in enhancing ABET learning positively. Nevertheless, ICT effectiveness depends greatly on digital literacy of the educators and infrastructure of the CLCs (Meladi and Awolusi, 2020). Educators require training, technology, and regulations to be able to use ICT effectively.

2.4.2 Availability of ICT Tools in CLCs

ICT tools are greater in number in urban CLCs as compared to rural CLCs. This is because urban CLCs have numerous desktops, Internet connection, and multimedia facilities since enough finances are available (Meladi and Awolusi, 2020). This is possible owing to cooperation from business organisations and NGOs to ensure that ICT tools are made available

in urban CLCs (Adelabu et al., 2022). On the other hand, the rural CLCs have neither computers nor Internet facilities (Mnisi, Mtshali and Makgato, 2024). Social inequalities exist in society such as illiteracy in rural inhabitants and technological backwardness.

Programs by the government, for example, the National Development Plan 2030 and ICT in Education Strategy in the Department of Basic Education, attempt to tackle this disparity through the equal distribution of ICT tools in educational institutions, which include CLCs (Shava, 2022). However, the implementation of such strategies has not always been consistent as rural areas do not have the financial and infrastructural capacity (Ngcapu, Simelane-Mnisi and Mji, 2022). While urban CLCs have state-of-the-art facilities, the facilities in rural CLCs have aged hardware that might not work with newer software and applications (Shobande and Asongu, 2022). Rural areas lack access to energy and internet sources, thus making ICT resources inaccessible (Yalley, 2022).

It is therefore necessary to take special care to ensure that all CLCs, no matter where they are, have access to ICT necessary for efficient education. These kinds of investments include the creation of more infrastructure in rural areas, as well as partnerships in sharing resources by governments and private organisations, and provision of low-resources learning technologies, among others (Meladi and Awolusi, 2020). In order to create an equal - ABET programme using ICT, it is necessary to address these issues.

2.4.3 Barriers to Accessing ICT Tools

ABET programmes help address the challenges that are linked with the cost, financing, and technical support of ICT. The purchase of laptops, tablets, and projectors is expensive for many CLCs, especially those having small budgets (Meladi and Awolusi, 2020). Institutions with small budgets are unable to purchase software and use the internet (Aruleba and Jere, 2022). Use of old equipment restricts CLCs from using advanced educational technologies (Mnisi, Mtshali and Makgato, 2024). High costs hinder the application of ICT, thereby preventing learners from using ICTs and the internet.

There is also the problem of inadequate technical knowledge among education professionals, thereby hindering the application of ICT in teaching processes (Adelabu et al., 2022). Most adult educators in ABET programmes lack digital and education technology skills, hence making it hard for them to operate complex ICT and solve the arising technical problems (Ngcapu, Simelane-Mnisi and Mji, 2022). Inadequate skills pose as a barrier to the

implementation of ICT, preventing educators from applying innovative ICT (Shobande and Asongu, 2022). There is also an issue of the lack of ICT support in most CLCs, which results in ICT problems remaining unresolved and interrupting teaching sessions (Yalley, 2022).

Problems arising due to inconsistency of power supply and lack of sufficient internet services make ICT difficult to be implemented into CLC programmes, especially CLC programmes in rural locations (Shava, 2022). Inequality in society leads to funding problems in such places, making things more difficult (Meladi and Awolusi, 2020). Solving these problems requires additional financing of ICT infrastructures, subsidised ICT devices, and affordable internet connections for poor communities, along with training of educators on the proper application of ICT (Adelabu et al., 2022). Solving such issues may lead to implementation of ICT within ABET programme in South Africa.

2.5 Integration of ICT into Teaching and Learning in ABET

This section reviews how ICT is incorporated into adult teaching and learning, with attention to pedagogical strategies, educator competence and the contextual constraints that shape classroom-level use.

2.5.1 Strategies for ICT Integration in Adult Education

For ICT integration into the existing ABET system, different strategies should be employed since the adult learners face difficulties in reading, planning their activities, and mastering technology. Blended learning involves integrating face-to-face instruction with online and technological tools for flexible learning (Meladi and Awolusi, 2020). Moodle and Google classroom allows educators to provide materials, assignments, and discussions to learners even when they are not in class (Shava, 2022). The adult learners who cannot join classroom sessions because of other responsibilities will benefit from blended learning as they can learn on their own time (Mnisi, Mtshali and Makgato, 2024). It is considered ‘learner-centred’, since educators use digital resources to design a course suitable for learners.

Gamification involving the use of points, competitions, and awards for engagement and motivation is yet another method of teaching that works well (Abel, Tondeur and Sang, 2022). Both Kahoot and Quiz have proven successful in engaging adult learners through engaging and fun classes (Yalley, 2022). It is very effective in ABET, which is characterised by many learners being marginalised due to negative experiences or lack of confidence. The element of

fun and competition in gamification is known to motivate and make learners to be more participative (Adelabu et al., 2022).

A third trend that is gaining ground is the use of mobile technology, which uses the abundance of cell phones and mobile networks in South Africa to connect with learners from distant places (Ngcapu, Simelane-Mnisi and Mji, 2022). Applications such as WhatsApp, Duolingo, and Quizlet facilitate communication between the educator and learners and help the educator to disseminate educational material and evaluate the performance of pupils living in deprived neighbourhoods (Shobande and Asongu, 2022). This model of education delivery performs effectively in ABET classrooms that lack computer facilities and internet connectivity (Shava, 2022). These technologies have the potential to revolutionise adult education if certain conditions are met.

2.5.2 Educators' Competence in ICT Use

The importance of ICT skills possessed by the adult educators as well as the application of the ICT within the ABET has been recognised. The adult educators in South Africa, especially those from disadvantaged areas, have been accused of incompetence and inability to make use of the ICT effectively (Meladi and Awolusi, 2020). There can be difficulties encountered by adult educators when applying ICT in their work (Mnisi, Mtshali and Makgato, 2024). New and inexperienced educators tend to shun (avoid) Google Classroom and multimedia editing software, altering the manner of instruction (Shava, 2022).

Technologies undergo constant changes and developments, thus limiting the ability of adult educators to keep up with the pace (Ngcapu, Simelane-Mnisi and Mji, 2022). The use of data analytical tools within learning management systems and interaction features on gamified apps would require some digital competences (Abel, Tondeur and Sang, 2022). Such ICT lags affect the quality of teaching and erode the trust of educators in new technologies (Adelabu et al., 2022). For example, ABET educators must be flexible and creative when teaching learners who vary widely in literacy or learning styles (Shobande and Asongu, 2022). With inadequate support from professional training, most adult educators feel threatened by ICT integration.

Such difficulties require special professional development programmes that will prepare educators how to use ICT in education (Shava, 2022). Professional development should be about training educators how to use digital technologies and use them for the desired purpose. The mentorship, peer collaboration, and technical assistance will help educators develop their

confidence and overcome obstacles (Ngcapu, Simelane-Mnisi and Mji, 2022). Through the enhancement of educator skills, better educational outcomes, and empowerment of both educators and learners, South Africa can integrate ICT into its ABET program.

2.5.3 Challenges in ICT Integration

The integration of ICT into the ABET curricula continues to present challenges, leading to the ineffectiveness of the program. Educators and learners' resistance to change can hardly be resolved. The adult educators see the integration of ICT as an issue affecting their form of teaching (Meladi and Awolusi, 2020). This may be attributed to their distrust in the use of digital tools and the capacity of such tools to improve teaching practice (Shava, 2022). The rejection of ICT by the adult learners can be associated with the lack of technological competence and the fear of failure since adult learners usually experience problems with reading (Adelabu et al., 2022).

The digital tools can hardly be integrated into teaching and learning processes because of the insufficient level of ICT literacy demonstrated by educators (Mnisi, Mtshali and Makgato, 2024). The problem is that the educators are unfamiliar with digital technologies, therefore, cannot implement ICT in their practices (Ngcapu, Simelane-Mnisi and Mji, 2022). Rural educators are less competent than those working in urban areas since rural educators have fewer professional development opportunities (Shobande and Asongu, 2022).

The deployment of ICT within the context of ABET is hindered by several factors including the lack of finances, infrastructure problems, and technical difficulties (Abel, Tondeur and Sang, 2022). In addition to that, the internet, technological tools, and software licensing are insufficient in many CLCs situated in remote and economically challenged settings (Meladi and Awolusi, 2020). This problem cannot be addressed without having the necessary skills among IT professionals, which will have an adverse impact on the entire process of learning and reduce the influence of ICT tools (Adelabu et al., 2022). ICT can contribute significantly to ABET in South Africa if used properly.

2.6 Pedagogical Value of ICT Integration in ABET

This section considers the reported pedagogical value of ICT in adult learning, while distinguishing perceived benefits from empirically measured learning outcomes.

2.6.1 Enhancing Learner Engagement and Participation

ICT tools encourage and involve adult learners in ABET settings where there is no motivation and literacy. Learning Management Systems (LMS), Interactive Whiteboard, and gamified applications facilitate effective lectures (Meladi and Awolusi, 2020). Tools such as Kahoot and Quizizz aid the educators in creating competition games and quizzes with incentives for motivation of the learners (Mnisi, Mtshali and Makgato, 2024). The learners are also motivated to engage in learning if their interaction with peers, content, and educators takes place in real time (Shava, 2022).

Google Workspace and Microsoft Teams offer remote collaboration and learning (Shobande and Asongu, 2022). With such learning tools, the educators are able to set teamwork assignments to create an authentic environment for learning. Teamwork improves interpersonal relations and inclusiveness among the learners with varied backgrounds and education levels (Adelabu et al., 2022). Learners with difficulty comprehending text are encouraged through multimedia presentation lessons and video lectures (Ngcapu, Simelane-Mnisi and Mji, 2022). It becomes easier for the educator to explain complicated topics.

The incorporation of ICT in an effective manner helps maximise learning outcomes. The success of their implementation is determined by how effectively they are used to fulfil the requirements of ABET learners. Educators need to be trained on how to incorporate ICT technology to ensure that the learning process becomes more engaging for adult learners (Shava, 2022).

2.6.2 Improving Learning Outcomes

The application of ICT in ABET, supports learning by customising learning materials. The use of adaptive learning systems enables the educators to tailor the learning process according to the needs and capabilities of the learner (Meladi and Awolusi, 2020). This customisation helps address the areas requiring improvement in order to improve academic success (Abel, Tondeur and Sang, 2022). The materials include videos, articles and quizzes. They can be accessed via Moodle and Blackboard platforms. This provision benefits adult learners as they have other obligations.

ICT in ABET is useful in terms of improving academic success, problem solving, digital skills, and self-regulation of learning activities (Mnisi, Mtshali and Makgato, 2024). The learners are provided with an opportunity to apply theoretical knowledge in the form of interactive

simulations and multimedia learning (Shobande and Asongu, 2022). The vocational ABET programme equips learners with job skills. The learners can receive feedback based on ICT performance (Ngcapu, Simelane-Mnisi and Mji, 2022).

ICT benefits have been experienced through the learning process; however, the impact of ICT in ABET contexts is constrained due to the availability of ICT, the quality of the educators, and relevant curriculum. It is crucial for educators to be taught how to make use of ICT to unlock its true potential (Adelabu et al., 2022). There is a need to come up with policies that help bridge the digital divide in marginalised contexts (Shava, 2022).

2.6.3 Addressing Diverse Learning Needs

Through ABET programmes and ICT, it is made possible for learners of different disabilities, and various levels of education achieve their aims and objectives. Screen readers, text-to-speech, and adjusting font sizes make it easier for visually, auditory, and physically disabled learners to access educational material (Shobande and Asongu, 2022). Visual impairment is not a hindrance anymore as people who are visually impaired are able to access online educational material through the use of JAWS and NVDA software programmes, which foster inclusive and equal learning (Meladi and Awolusi, 2020).

Podcasts and videos provide information differently according to the different needs of learners and thus accommodate learners with different disabilities (Mnisi, Mtshali and Makgato, 2024). It becomes easy for tutors to differentiate content to suit different learning styles. There are adaptive algorithms within ICT which assist in evaluating learners' levels of academic performance. Information is differentiated to address the different issues faced by different individuals. ICT facilitates differentiated learning.

Through ICT, learners can collaborate irrespective of their individuality and background, hence promoting inclusive learning. Learners can share information with each other through online tools such as forums and groups (Adelabu et al., 2022). The collaborative nature of adult learning assists in developing social skills among adult learners (Shobande and Asongu, 2022). Nonetheless, educators require ICT training to enable them to effectively implement ICT in inclusive ways. Furthermore, ICT strategies should be implemented to promote ICT inclusivity (Meladi and Awolusi, 2020).

2.7 ICT Professional Development for Adult Educators

This section reviews the availability, relevance and limitations of professional development intended to support adult educators' technical and pedagogical use of ICT.

2.7.1 Availability of Professional Development Programs

For inclusion of ICT tools into their work, South African adult educators require ICT professional development. The DBE e-Education Policy trains educators on the effective use of ICT (Ngcapu, Simelane-Mnisi and Mji, 2022). Also, partnerships between private and NGO sectors offer ICT certification, education courses and personal trainings for educators. Lessons on digital classroom management and creation through the Microsoft Educator Centre were offered by South African educators (Patricia, Isaac, and Manto, 2023). South African adult educators may find it difficult to balance their time with regards to professional training; for that matter, Coursera and Udemy offer online flexibility (Rana, 2023).

However, the above strategies were not useful in increasing accessibility for professional development opportunities particularly geographical one in the gap between the urban and rural communities. Urban CLCs provide advanced infrastructures as well as finances to facilitate regular ICT skill trainings for educators (Abel, Tondeur and Sang, 2022). Unlike their urban counterparts, rural CLCs lack internet connectivity and physical spaces where ICT skills can be trained to support professional growth (Shava, 2022). Nevertheless, mobile learning training units offer training on-site in some areas (Kilag et al., 2023). Rural educators undergo ICT trainings as metropolitan ones through mobile units.

Such approaches have huge possibilities, yet whether they will leave any lasting impact on the educators cannot be known yet. According to Ngcapu, Simelane-Mnisi and Mji (2022), lack of follow-up training has been one of the contributing factors to the failure to benefit from training. If the intervention is to bring a change, then there needs to be continued and contextualised training.

2.7.2 Barriers to ICT Professional Development

There are many challenges for professional development aimed at building the skills of South African adult educators concerning their adoption of ICTs, hence the difficulties that the transition of ABET into the digital era is likely to encounter. First, there is the challenge of time. Adult educators, because of work and other engagements, often lack sufficient time for professional development programmes (Rana, 2023). Arranging time can be challenging where

CLCs lack administrative staff. Without proper time allocation, the programmes would not be very effective.

Secondly, financial constraints are another challenge to ABET's ICT integration process. Many CLCs cannot afford to invest in the training of their adult educators, given their financial constraints (Shava, 2022). Poor educators cannot be able to bear the cost of professional development. Poor infrastructure and high Internet costs make Internet learning impossible for learners living in rural areas (Hashemi et al., 2022). NGO partnerships and private-sector partnerships, which facilitate cost-sharing practices, have not contributed much to solving ABET's financial challenges.

Resistance to change based on cultural factors and organisational factors has made it hard to implement learning through ICT. According to Abel et al., most of the educators, especially new ones, are highly suspicious regarding ICT as an education enhancer (2022). Resistance, normally, arises from technology insecurity and automation (Patricia, Isaac, and Manto, 2023). With no psychological or organisational interventions, there is no hope of training the educators in ICT.

2.7.3 Impact of ICT Training on Educators' Teaching Practices

Training in the provision of ICT education will allow educators to gain skills in ICT, thus enabling improved delivery. The educators who have been extensively trained in ICT have the capacity to control their classroom environment and teach effectively in comparison to those who lack ICT training (Rana, 2023). ICT training using technologies such as Moodle and Google Classroom provides a chance to create an environment for learning among the learners (Ngcapu, Simelane-Mnisi and Mji, 2022).

ICT training creates an opportunity for innovations in terms of how course content will be taught. In cases where educators are trained in game development and simulation, they will be able to develop games/simulations to assist learners to understand the subject matter. Training in virtual and augmented reality will mean that ICT-trained educators can use VR/AR in ABET instruction (Kilag et al., 2023).

ICT training does not affect only the educators; there are effects that go beyond the scope of the educators, especially when we consider the aspect of policy and practice. Trained educators act as role models in encouraging other educators to embrace the use of technology and keep on learning (Abel, Tondeur and Sang, 2022). ICT training requires mentoring and continuous

follow-up for its success. Where this mentoring is lacking, it becomes difficult for educators to embrace new technologies, thus reverting to conventional teaching techniques (Patricia, Isaac, and Manto, 2023).

2.8 The Digital Divide in South African ABET

This section examines the digital divide as a multidimensional problem involving not only access to devices and connectivity but also capability, institutional support and the ability to convert technology into meaningful learning.

2.8.1 Defining the Digital Divide

Speaking of the digital divide issue, it refers to the differences between different individuals or entities concerning their access to technology and the advantages that come from it. In the context of education, the term ‘digital divide’ should be interpreted more broadly than simply being equipped with the computing technology and accessing the internet; it has much to do with such factors as literacy, affordability, readiness of the educator to implement digital technology and efficiency of application of technology to improve the process of education. The research done by Aruleba and Jere (2022) shows that many challenges in the context of digital divide in South African rural and underdeveloped regions are caused by lack of infrastructure, high prices for the use of ICT and unpreparedness of educational facilities to introduce ICT. ICT has a positive effect on the improvement of teaching and learning only when educators get prepared for implementing the technology into practice, which is argued by Shava (2022). In the context of the ABET program, the importance of addressing the digital divide becomes evident, as adult learners rely heavily on CLCs.

The issue of the digital divide is important for ABET since learners have different backgrounds and different access to technology. According to Daniels (2020), a transformative learning experience can be cultivated for ABET by the establishment of an inclusive learning environment for marginalised learners. However, when there is limited access to resources which could enhance transformative learning, it makes such learning less effective. Possibilities of promoting mobile learning in adult learners have also been suggested by Ditlhale and van den Berg (2024); however, this will only be possible if learners have adequate access to connectivity and affordable technology. In addition, Nchabeleng (2024) notes that the issue of digitalisation in terms of education and training in community colleges of South Africa faces many barriers since both learners and educators have their challenges. This shows that the issue of digital divide faced by ABET learners is a problem not just for the learners,

but for the institution as well. Activity Theory provides that contradiction is created between the object and the tools, rules, and other conditions.

2.8.2 Inequalities in ICT Access in CLCs

The differences in availability of ICT at the CLCs could be attributed to socio-economic conditions and location, as well as institutional characteristics themselves. CLCs located in prosperous regions have greater access to electricity, internet, operating equipment, and external assistance. In contrast, rural areas and impoverished localities lack infrastructure, internet connection, and electronic devices altogether. According to Munje and Jita (2020), lack of ICT equipment in South African schools impacts teaching effectiveness and the results achieved by children, preventing efficient utilisation of modern technologies in the process of learning. Although this research paper is concerned with the problem in primary schools, its conclusions are applicable to the situation discussed here as there should be even less ICT equipment in CLCs. Belete et al. (2022) explain that CLCs operate within communities and therefore largely depend on available resources and institutional assistance.

Further, one needs to recognise that according to scientific sources, ICT technologies as components of equality cannot be limited by the existence or non-existence of such technologies within the centre itself. Availability of the personal one and pedagogical is required here. In particular, as Abel et al. (2022) suggest, the views and perception of educators can influence the use of ICT technologies in education and training. Besides, considering the ideas expressed by Land (2021), it becomes clear that the context of working of adult educators in South Africa in connection with community colleges is quite complicated and influences not only the process of training but also the work of educators as well. In addition, Sasere and Makhasane (2023) prove the necessity of applying adult learning theories in order to solve the problem of lack of ICT skills among educators in South Africa. The significance of the findings obtained by the aforementioned researchers is conditioned by the complexity of the notion of access to ICT technologies, which includes a number of aspects. They include technical, professional and educational ones. However, there is no information about decision-making of ABET educators in case of low availability of ICT technologies.

2.8.3 Bridging the Digital Divide

Nonetheless, certain changes need to be made regarding ABET in South Africa. Indeed, while the country managed to formulate its digital policy with a primary emphasis on the importance of digital literacy as one of the key prerequisites making it possible to act correctly within both

economic and social spheres of South African society, there is a chance that such a policy may prove difficult to implement considering the insufficient educational infrastructure in place. As reported by the Department of Communication and Digital Technologies (2020), digital literacy has been identified as the primary precondition of sustainable development in the country. It becomes evident that without the adequate infrastructure, availability of the internet, and learning materials, digital policies will amount to nothing more than wishful thinking. On that note, it should be mentioned that, according to Mnisi, Mtshali, and Makgato (2024), there is a specific problem facing educational institutions in South Africa concerning the transition from technological education.

There might always be cases when low-cost and community-oriented solutions could prove effective for combating digital exclusion among ABET learners. Such solutions may include mobile learning, offline technologies, community Wi-Fi, digital libraries, and cheap connectivity, thus functioning as an adequate replacement for infrastructure development in those cases when the creation of high-quality infrastructure is not possible. Mobile learning is an example of such solution, according to Ditlhale and van den Berg (2024), insofar as the technology expands access to education for adults only when it works for them. Also, according to Rana (2023), ICT could become relevant in cases when an educator, who contemplates implementing ICT, considers them as appropriate. Last but not least, ICT implementation depends on the teaching environment, as noted by Kafu-Quvane (2021). From all the information provided above, it may be concluded that bridging the digital divide is contingent on the consideration of both technical and professional aspects. However, no signs can be seen indicating that anyone is to blame.

The analysis of the existing literature on the issue of the digital divide reveals a contradiction between the impact of ICTs and the actual conditions in ABET centres. ICT enables flexibility in learning and active participation of learners in dealing with educational material. Nevertheless, it is possible to create an unequal environment through ICT as it would work effectively for those ABET centres that have enough resources, specific subjects and ICT experts. Mahlo and Waghid (2023) state that the influence of ICT on South African education needs to be analysed in terms of capability. This means that the presence of ICT resources does not always indicate the capability to make use of these resources for learning, job hunting, or social activities. The capability to benefit from ICT technologies is especially relevant for ABET, as adult learners must be able to utilise ICT tools for these purposes.

2.9 Research Gaps Emerging from the Literature

The reviewed body of literature shows that ICT usage in the South African educational setting is contingent upon several aspects including infrastructure, competences of educators, resources of institutions, as well as access to ICT on the part of learners. At the same time, it becomes clear that the research literature available focuses predominantly on the implementation of ICT within educational settings including schools, institutions of higher education, or TVET colleges, but not CLCs. The first example is the research paper written by Mahlo and Waghid (2023) in which ICT integration by means of educators at township public primary schools is analysed. Mapisa and Makena (2024) also touch upon the issue of ICT adoption but within the context of primary schools in the Eastern Cape province. Another relevant study conducted by Holler, Brändle and Zinn (2023) focuses on digital competencies among South African TVET educators. They are quite valuable for this study in terms of demonstrating how digital learning issues may arise everywhere. At the same time, ABET is unique due to its adult-focused nature, non-formal part-time learning opportunities, and limited institutional resources.

Yet another research gap relates to the application of different perspectives for understanding the process of ICT adoption by adult learners. In this respect, more emphasis tends to be laid on researching the issue from the angle of educators, while research into adult learners is focused on the problem of access or policy implementation. However, there are hardly any studies related to the different perspectives of adult educators, adult learners, and centre managers operating in the same CLC. That is due to the fact that sometimes data can be obtained regarding the perspectives of adult educators on ICT adoption. Thus, according to Abel, Tondeur, and Sang (2022), one can learn about the perspectives of adult educators regarding ICT adoption. Moreover, Nchabeleng (2024) offers some information regarding the problems adult learners and their educators experience within the scope of community education and training programmes. Moreover, Maceke (2025) examines some of the problems associated with ICT implementation in CLCs in South Africa. The opinions of various stakeholders including those from ABET centres have yet to be considered since ICT implementation in adult education context is rather complicated.

Another piece of evidence which needs to be examined concerns the correlation between educators' competence in working with ICT and implementation of technology in education. Given the literature review carried out beforehand, it is possible to say that despite the level of educators' proficiency in terms of working with ICT, there is a range of barriers which prevent

educators from using them in order to prepare lessons, communicate with learners, assess their progress, and introduce a learner-centred approach. First of all, one can refer to the information provided by Strydom et al. (2021) that digital literacy includes such qualities as having proper skills needed to use ICT and derive benefits from them in teaching processes. The inability to use modern ICT when teaching can be evidenced by the following literature by Nyathi and Joseph (2024) and Sasere and Makhasane (2023). Nonetheless, the chosen literature sources cannot be considered effective, as they do not address the issues that hinder adults' use of ICT in ABET programmes.

2.10 Theoretical framework

This section presents the two theoretical lenses used in the study. Activity Theory explains systemic relationships and contradictions, while Diffusion of Innovation Theory explains adoption-related perceptions and processes. Their strengths, limitations and complementary use are discussed below.

The theoretical framework provides a foundation for the research study conducted. In addition, it plays a crucial role in enabling the researcher to understand the phenomenon being studied while helping him interpret the research findings based on previous knowledge (Hirose and Creswell, 2023). Hirose and Creswell (2023) note that theoretical frameworks enable one to understand relationships between variables, concepts, and social process within a study. The current study is built on a theoretical framework grounded on Activity Theory and Diffusion of Innovation Theory. These two were brought together with a view to giving complementary views on ICT in the two studied CLCs.

According to Ikeda and Binarkaheni (2024), Activity Theory is defined as offering a socio-cultural and systemic approach to studying the interactions between educators, learners, the institution, and ICT tools used in learning and education. On the other hand, Bokolo (2023) asserts that the Diffusion of Innovation Theory offers a suitable theoretical framework because it helps to understand innovation adoption, diffusion, communication, and implementation of the innovations such as ICT.

2.10.1 Activity Theory

2.10.1.1 History and Origin of Activity Theory

Activity Theory emerged from the cultural-historical tradition of Russian psychology in the early twentieth century. Its foundations are strongly associated with the work of Lev Vygotsky,

who argued that human learning and development are socially and culturally mediated rather than occurring independently of the social environment (Vygotsky, 1978; Asmolov, 2022). Vygotsky emphasised that learning takes place through interaction with other people and through cultural tools and signs, including language, symbols and material technologies (Vygotsky, 1978).

A key concept emerging from Vygotsky's work was mediated action. Human beings do not act directly on their environment but make use of material and psychological tools and signs to mediate their activities and interaction with the world (Vygotsky, 1978). This concept became an important foundation for the subsequent development of Activity Theory.

Vygotsky's ideas were further developed by Alexei Leontiev, who shifted attention from individual mediated action towards collective and object-oriented activity. Leontiev argued that human actions occur within broader socially organised activities that are directed by motives, and he distinguished between activities, actions and operations as different levels within the structure of human activity (Leontiev, 1978). This development expanded the theory beyond individual cognition and placed greater emphasis on collective human practice.

One of the most prominent extensions of Activity Theory was developed by Yrjö Engeström. Engeström expanded the activity-system model to include the subject, object, mediating tools, rules, community and division of labour, thereby providing a framework for examining how multiple elements interact within collective activity (Engeström, 1987). He also foregrounded contradictions within and between elements of an activity system as potential sources of tension, change, learning and transformation (Engeström, 1987, 2001). Activity Theory has subsequently been applied extensively to the study of education, organisational learning, educational technology and workplace practices because of its capacity to examine complex relationships within socially organised systems (Engeström, 2001).

2.10.1.2 Relevance of Activity Theory to the Study

Activity Theory applies to this study because it provides a comprehensive approach for examining the integration of ICT into CLCs. It enables the researcher to understand interactions between different elements in the learning environment that affect teaching and learning processes. In this study, the researcher seeks to compare ICT integration across two contrasting CLCs. Using Activity Theory, the researcher seeks to understand how technological tools, institutional rules, social organisation, community relationships and the division of labour influence ICT integration among educators and learners.

Activity Theory is particularly relevant because it recognises that contradictions may exist among different elements of an educational activity system. Contradictions are not simply isolated problems but historically developing tensions within or between components of an activity system that may constrain existing practices while also creating possibilities for change (Engeström, 1987, 2001). For example, educators might be expected to integrate ICT despite having limited technological resources, insufficient professional development or poor connectivity. Such conditions can create contradictions between the tools available, institutional expectations, educator capabilities and the object of improving teaching and learning through ICT. Activity Theory therefore provides an appropriate analytical lens for gaining an in-depth understanding of ICT integration within ABET Community Learning Centres.

Activity Theory is particularly useful for identifying contradictions among tools, rules, actors, community expectations and the division of labour (Engeström, 1987, 2001), making it suitable for analysing under-resourced institutional environments. Its broad systemic scope can, however, make it less precise in explaining why individual educators working within the same activity system may differ in their willingness to adopt the same technology. This limitation is addressed in the present study through the complementary use of Diffusion of Innovation Theory.

2.10.2 Diffusion of Innovation Theory

2.10.2.1 History and Emergence of Diffusion of Innovation Theory

Diffusion of Innovation Theory was formulated by Everett Rogers, with the first edition of Diffusion of Innovations published in 1962. Rogers developed the theory from earlier research across disciplines such as sociology, communication, anthropology and agriculture to explain how new ideas and practices spread through populations and social systems (Rogers, 2003).

Diffusion refers to the process through which an innovation is communicated through particular channels over time among members of a social system (Rogers, 2003). The theory is therefore concerned not only with whether an innovation is adopted, but also with how information about it spreads, how potential adopters perceive it, and how adoption occurs over time. Rogers (2003) identifies the innovation, communication channels, time and the social system as central elements of the diffusion process.

The theory has subsequently been applied across disciplines including healthcare, agriculture, communication, organisational studies and education, particularly in research examining the

adoption and implementation of new technologies and practices (Rogers, 2003). Its focus on how potential users perceive innovations makes it especially relevant to studies of educational technology adoption.

2.10.2.2 Core Constructs and Relevance of Diffusion of Innovation Theory

Diffusion of Innovation Theory is relevant to this study because it explains adoption partly through five perceived attributes of an innovation: relative advantage, compatibility, complexity, trialability and observability (Rogers, 2003). Relative advantage refers to the extent to which an innovation is perceived as better than the practice or idea it replaces. Compatibility concerns the extent to which an innovation aligns with existing values, experiences and needs. Complexity relates to how difficult the innovation is perceived to be to understand and use, while trialability concerns opportunities to experiment with an innovation before committing to its regular use. Observability refers to the extent to which the results or benefits of using an innovation are visible to others (Rogers, 2003).

In this study, relative advantage concerns whether educators view ICT as improving teaching or learning; compatibility concerns its alignment with adult-learning needs and existing teaching practices; complexity concerns educators' perceived difficulty in using particular technologies; trialability concerns opportunities to experiment with ICT tools before their routine use; and observability concerns whether the benefits of ICT-supported teaching and learning are visible to educators, learners and colleagues. These constructs provide a structured way of interpreting why ICT adoption may vary even where some technological resources are available.

A strength of Diffusion of Innovation Theory is its clear explanation of differences in the uptake of innovations and the role that perceived characteristics play in adoption decisions (Rogers, 2003). However, diffusion and adoption are also influenced by characteristics of adopters and by wider social, institutional and environmental contexts (Wejnert, 2002). Adoption-diffusion approaches may therefore become limited when complex innovations depend on interacting technologies, institutional arrangements and user practices that cannot be explained solely through individual adoption decisions (Gruber, 2020).

This limitation is particularly relevant to the present study because educators' decisions to use ICT may be affected by institutional rules, infrastructure, connectivity, professional development opportunities and unequal access to resources. Activity Theory addresses this limitation by foregrounding the wider activity system and the structural conditions within

which individual choices are made. Conversely, Activity Theory is strong in diagnosing systemic relationships and contradictions but is less specific about the perceived attributes of an innovation that may influence an individual's willingness to adopt it. The combined framework therefore offers complementary, rather than competing, explanations of ICT integration.

2.10.3 Relationship Between Activity Theory and Diffusion of Innovation Theory

The combined use of Activity Theory and Diffusion of Innovation Theory provides complementary perspectives on ICT integration in CLCs. Activity Theory supports analysis of the socio-cultural and systemic relationships among educators, learners, technological tools, institutional rules, community and division of labour, including contradictions that may constrain or enable ICT use (Engeström, 1987, 2001). Diffusion of Innovation Theory supports analysis of how educators perceive, accept and adopt ICT innovations, particularly in relation to relative advantage, compatibility, complexity, trialability and observability (Rogers, 2003).

Together, the two theories enable a more holistic interpretation of both systemic conditions and individual adoption dynamics. This complementary approach is important because innovation adoption is affected not only by the perceived characteristics of an innovation or the individual adopter but also by the broader social and environmental context in which adoption occurs (Wejnert, 2002). Contemporary adoption-diffusion scholarship similarly indicates that technology adoption increasingly involves interacting technological, institutional and behavioural systems that cannot always be adequately explained through an individual-level perspective alone (Gruber, 2020).

In the present study, Activity Theory is therefore used primarily to examine the wider CLC activity system and identify contradictions involving tools, rules, community, division of labour and institutional conditions. Diffusion of Innovation Theory is used to examine educators' perceptions of ICT and the factors that may influence their willingness to adopt and continue using digital technologies. The two theories are not treated as competing explanations. Instead, Diffusion of Innovation Theory provides greater analytical specificity regarding individual perceptions and adoption, while Activity Theory situates those perceptions and decisions within the structural and socio-cultural conditions of the CLC.

Taken together, the reviewed studies also reveal an important methodological limitation in the existing evidence base. A substantial proportion of South African ICT-in-education research considered in this review is located in schools, universities or TVET colleges rather than CLCs, as illustrated by studies examining ICT integration in public schools and digital competence in TVET contexts (Mahlo and Waghid, 2023; Mapisa and Makena, 2024; Holler, Brändle and Zinn, 2023). These studies are valuable for identifying recurring constraints such as connectivity, educator competence and resource inequality, but their findings cannot be transferred directly to CLCs because adult learners, community-based provision and CET governance create different institutional and pedagogical conditions. The present study addresses this gap by using two CLC cases and incorporating the perspectives of educators, learners and centre managers, with supplementary documentary evidence used to examine the policy-practice relationship.

2.11 Summary

In conclusion, the discussion about literature on ICT for South African ABET, especially CLCs, adult educators and adult learners, and digital divides, has been covered in this chapter. Clearly, from the reviewed literature, there is no doubt that ICT have a huge potential in fostering flexible learning, engaging learners, visualisation, differentiation, and ICT skills among learners. Furthermore, CLCs have an essential role to play in lifelong learning and adult education at the community level. As already mentioned above, according to Belete et al. (2022), the CLCs can be viewed as spaces of adult learning and education through community development. Moreover, Daniels (2020) states that ABET is considered to be a transforming space for marginalised adult learners. In addition, according to Akintolu and Letseka (2021), an adult-oriented approach should be given special attention. Hence, ICT have a huge potential in supporting ABET when the following two requirements are met.

Apart from those discussed above, there are a number of others which should be highlighted in relation to literature. Firstly, while the process of digital transformation is usually associated with the emergence of ICT and digital skills, there is a lack of relevant means that could help to implement them. As stated by the Department of Communications and Digital Technologies (2020), digital skills are crucial for the development of a country. Nevertheless, as pointed out by Aruleba and Jere (2022), some obstacles do not allow one to reach the targets of digital transformation due to the lack of means. Secondly, as emphasised by Mnisi, Mtshali, and Makgato (2024), technical problems are among the factors that hinder the further improvement of educational institutions within a state. From the point of view of Activity Theory, this

contradiction is characterised by the discrepancy between the object of activity and the means (tools, rules, division of labour).

According to the literature, the application of ICT relies on the following variables: infrastructure, educators' preparedness and skills, devices availability, professional development, and others. Accordingly, the major gaps that need to be addressed in the current scientific background on this issue involve analysis of the aforementioned elements and their interrelationships within particular CLCs. Hence, information concerning schools, colleges and universities will be relevant for discussion in relation to the topic at hand. Nevertheless, given the particular characteristics of ABET, this issue deserves greater attention. For example, in his paper, Land (2021) analyses the notion of the professional identity of an adult educator working at community colleges. Moreover, in Nchabeleng's (2024) article one can find the problems related to the digitisation of the education process in community and training colleges. Besides, in her paper, Maceke (2025) addresses issues regarding adult education in CLCs in South Africa. However, additional investigation is required in order to analyse the issue in ABET centres using the case study approach.

Moreover, there remains a huge problem related to the digital divide issue when it comes to the incorporation of ICT in the ABET process. In particular, according to the article, the digital divide is not simply about the availability of computers and Internet connection; it is also about the ability of educators and learners to work with the technology. For example, Mahlo and Waghid (2023) state that ICT need not only to be made available, but transformed into learning as well. On the other hand, Ditlhale and van den Berg (2024) indicate that mobile learning can make it possible to enhance access to ICT, yet only in case the context issues are tackled in an appropriate manner. Furthermore, the authors highlight the importance of ICT-based training for educators in terms of their pedagogical skills. All of the aforementioned clearly shows the importance of pedagogical aspects when working with ICT in the ABET process. Finally, considered the theoretical basis for the research. Activity Theory offered a theoretical framework of a socio-cultural and systems perspective to help understand the relationships between educators, learners, tools, rules, and structures that play a role in influencing ICT implementation in CLCs. On the other hand, the Diffusion of Innovation Theory offers an understanding of how ICT innovations are adopted and diffused among educators and learners. The combination of the two theories was helpful in providing a holistic approach in understanding ICT implementation in CLCs.

CHAPTER 3: RESEARCH DESIGN AND METHODS

3.1 Introduction

The incorporation of ICT into South African ABET teaching and learning was analysed using the research design and methodology employed in this study. The availability, incorporation, and educator professional development of ICT were investigated in two CLCs. In qualitative interpretivist research, the collection of lived experiences of centre management, educators, and learners regarding ICT incorporation was emphasised. Experts on ICT incorporation were purposely selected to participate to enhance the research outcomes. Even though a semi-structured interview helps in meeting the aims of research, it is flexible and allows open-ended questions. Thematic analysis helped identify common themes in the collected data, making it easier to comprehensively analyse ICT integration and its systems and pedagogy.

3.2 Rationale for Empirical Research

Due to the lack of information on ICT accessibility, utilisation, and the advantages of ICT use in adult education, it became crucial to conduct a research study on the application of ICT in ABET classes in CLCs in South Africa. ICT has brought revolutionary changes to education worldwide (Ponce et al., 2022). However, ICT use in adult education, specifically within CLCs in South Africa, remains under-researched. It became necessary to conduct an empirical study on the subject because no prior empirical studies on the impact of ICT training on ICT adoption in adult education existed (Dang et al., 2024; Mannheimer, 2024).

Adult learners and educators in CLCs face unique challenges and problems that have not been analysed in other educational studies (Khankeh et al., 2015; Nchabeleng, 2024). Those adult learners represent different ethnocultural groups that need specific approaches to ICT adoption and implementation. Therefore, it became necessary to conduct a study to examine the effects of ICT access, adoption, and use on the learning process. This research aimed to investigate the problems and possibilities.

The present study was positioned within the broader goal of digital inclusion by examining the conditions under which equitable access to ICT can become pedagogically meaningful in under-resourced adult-learning settings. Through two case studies, the study analysed ICT incorporation in CLCs within South African ABET and considered both systemic and pedagogical factors that shaped access and use. The research therefore sought to provide

evidence-based recommendations for strengthening ICT integration in adult education (DCDT, 2020; Aruleba and Jere, 2022).

3.3 Research Design

The study employed an interpretivist qualitative methodology to investigate ICT integration in teaching and learning at two Community Learning Centres in the Eastern Cape. The approach was appropriate because the study sought to understand the meanings that adult educators, adult learners and centre managers attached to ICT access, classroom use, pedagogical value and professional development rather than to estimate population parameters. The two CLCs were treated as bounded institutional cases within the public CET sector, with contextual variation in resources and support forming part of the case comparison (Yin, 2018; Belete et al., 2022).

A multiple-case study methodology was adopted because the two CLCs represented bounded, real-world institutional settings in which ICT integration could be examined in context. The centres were selected purposively because both provided community learning programmes and had direct relevance to the study's ICT questions, while differing in the range, functionality and accessibility of ICT resources. Both centres were situated within the Eastern Cape CET context and were anonymised as Centre A and Centre B in the thesis to protect institutional confidentiality. This purposive contrast supported analytical comparison without implying statistical representativeness (Yin, 2018).

3.3.1 Multiple-Case Holistic Case Study Design

In this study, a multiple-case holistic case study design was used in accordance with Yin's (2018) definition of case study research, which is well-suited to studying current phenomena in real-life settings. In this case, the design entailed studying two CLCs as distinct cases, with each centre treated as an entity and not broken down into small subunits. A holistic approach to design is relevant to this case because the study sought to examine the overall level of ICT integration across the CLCs under consideration. Using multiple cases in the study helped compare similarities and differences between the two cases; this was necessary because ICT integration in ABET learning can vary across the two centres due to factors such as technology availability, leadership, and educator skills.

The use of multiple-case holistic research methodology was also consistent with the theoretical paradigm. In line with the tenets of Activity Theory, the CLCs were viewed as activity systems in which interactions among educators, learners, ICT tools, institutional norms, and community

norms occurred and influenced the teaching-learning process. This way, the methodology allowed for an exploration of the contradictions arising from the availability of some ICT tools with respect to institutional norms for their application, as well as from educators' responsibilities and the support provided for incorporating ICT. On the other hand, the methodology was suitable from the perspective of the Diffusion of Innovation Theory, as it helped reveal educators' perceptions of ICT use regarding its advantages, compatibility, complexity, trialability, and observability. As noted by Kafu-Quvane (2021), the implementation of ICT depends primarily on educators' experience and context.

The approach to data collection through semi-structured interviews was chosen because these interviews could describe in detail the interviewees' experiences with ICT integration in their own words, without losing track of the topics discussed in relation to the research questions. Issues discussed in such interviews included the availability and access to ICT, methods of ICT-based teaching, participation of adult learners in ICT-enhanced learning processes, professional development, and opportunities for ICT integration provided by organisations. The adult educators described how ICT was employed in their lessons; the adult learners provided information about their learning experience and the use of the ICT available to them; while the centre managers provided insight into the organisational perspective on the implementation of ICT. As indicated by Bell et al. (2022), semi-structured interviews may be utilised to explore issues arising from research questions.

A thematic analysis was employed to analyse the qualitative data derived from the interview process. The thematic analysis was designed to reveal trends in availability and access to ICT, frequency of use, the educational significance of ICT, professional development for educators using ICT, and institutional support for ICT integration. The thematic analysis was a relevant choice because it allowed grouping responses according to themes relevant to the research questions without ignoring other aspects raised by the respondents. Thematic analysis was a valid method because it allowed comparison across participant groups and between the two centres involved in the study. According to Bell et al. (2022), qualitative data analysis is a complex process that involves interpreting data for its meanings, patterns, and context. In this instance, however, qualitative data analysis was not conducted using a phenomenological approach, as the analysis was not intended to explore the essence of experience. Instead, it involved the use of ICT in two CLCs.

3.3.2 Researcher Positionality and Reflexivity

As a former adult educator, the researcher's experience added context to ABET and CLCs, as well as to the challenges of educating adults in resource-poor settings. Yet, as adult educators, reflexive practice became a necessity because past experiences might influence how we understand participants' narratives. As explained by Land (2021), the role of adult educators in community colleges involves complex practices that cannot be assumed and must be understood. Further, ABET is associated with educational marginalisation and educational transformation as explained by Daniels (2020). For this reason, the participants' narratives became integral to the researcher's sense-making, without pre-existing assumptions about ICT integration.

The researcher was not occupying any managerial or supervisory position at the CLCs where the study was conducted. This was necessary because the subjects would have to freely disclose information on the provision of ICT, support services, professional development, and instructional practice. However, the researcher's pre-existing interest in the application of ICT in adult education may lead to the impression that the utilisation of ICT in ABET programmes is always advantageous. Reflexivity techniques were applied throughout the research to address this issue. According to Bell et al. (2022), considering personal perceptions and experiences, and their effects on research outcomes, can be beneficial for qualitative research. Hence, the use of reflexivity techniques in the current study considered both the positive and negative perceptions.

Some steps were taken to bracket preconceptions and maintain the study's validity. Open-ended interview questions were utilised to allow participants to express their experiences rather than reinforce the researcher's expectations. Reflective notes were written throughout the research process to capture initial impressions and any assumptions or decision-making processes involved in conducting the study. During data analysis, the transcripts were continually reread to ensure that themes emerging from them reflected participants' views rather than the researcher's understanding of ICT integration. Quotations were directly cited to ensure participants' voices were captured and could be used to interpret the findings. Reflexivity was necessary since ICT integration in ABET is neither all good nor bad.

3.4 Research Methods

3.4.1 Selection of Participants

Purposive sampling was used to recruit 10 information-rich participants across the two cases: 4 adult educators, 4 adult learners and 2 centre managers, with 5 participants drawn from each centre. The sample was designed to provide role-based depth rather than statistical representation and ensured that classroom, learner and institutional perspectives were represented in each case. Qualitative sample adequacy depends on the relevance and information value of participants, the specificity of the research questions and the point at which further data cease to add materially new thematic insight (Sebele-Mpofu, 2020; Naeem et al., 2024).

Where more individuals met the eligibility criteria than were required for a category, participants were selected purposively on the basis of direct experience with the centre's teaching-and-learning environment, the availability or use of ICT, length of exposure to the programme, and willingness to participate. During data collection and preliminary review, interview accounts were compared across participant categories and the two centres. The later interviews largely reinforced the four recurring domains already evident in the data - access, patterns of use, perceived pedagogical value and professional development/support - and no materially new domain emerged. This was treated as thematic sufficiency for the bounded cases rather than as a claim of universal saturation.

Attention was important in the study because educators were expected to transform ICT tools into a learning process. The intended participants in the study are adult educators, who are expected not only to apply the curriculum but also to understand the challenges, programmes, and failures in integrating ICT. According to Land (2021), adult educators practising in South African community colleges are exposed to challenging environments due to training and institutional capacity. Adult learners, who can offer another perspective on the topic due to their challenges, experiences of access and use, and support, also represent a significant stakeholder in the study. As indicated by Belete et al. (2022), CLCs were community-oriented centres designed to meet the needs of adult learners; therefore, it was important to consider whether ICTs would help achieve this aim.

The study applied clear inclusion criteria to ensure that participants were relevant to the research aim and able to provide meaningful information. Participants were included in the study if they met the following criteria:

- Adult educators had to be currently teaching at Centre A or Centre B.
- Adult educators had to have at least one year of teaching experience in ABET or CLC programmes.
- Adult educators had to be involved in a learning area where ICT was used, available, or potentially relevant to teaching and learning.
- Adult learners had to be enrolled at Centre A or Centre B at the time of data collection.
- Adult learners had to have attended the centre for at least one academic term to ensure that they had sufficient experience of the teaching and learning environment.
- Adult learners had to have direct experience of learning in a setting where ICT tools were available, used, or discussed as part of teaching and learning.
- Centre managers had to be responsible for centre administration, resource coordination, staff support, ICT-related decision-making, or institutional reporting.
- Participants had to be willing to participate voluntarily and provide informed consent.

The study also applied exclusion criteria to ensure the sample's relevance and coherence. Participants were excluded from the study if they met any of the following conditions:

- Educators who were not teaching at either Centre A or Centre B were excluded.
- Educators with no involvement in ABET or CLC programmes were excluded.
- Learners who were not enrolled at either Centre A or Centre B were excluded.
- Learners who had attended the centre for less than one academic term were excluded because they may not have had sufficient exposure to the centre’s ICT-related teaching and learning practices.
- Centre staff members whose roles were not linked to teaching, learner support, ICT resource use, management, or institutional coordination were excluded.
- Individuals who were unwilling to provide informed consent or who chose to withdraw from the study were excluded.

- No participant was excluded based on low ICT proficiency, since the study aimed to capture varied experiences of ICT access, limited exposure, confidence, use and non-use within CLCs.

The final sample included the key stakeholder categories involved in ICT integration at the two centres chosen for the study. Adult educators could provide insights into lesson planning, classroom activities, the need for and limitations of professional development, and related topics. Adult learners could supply data on ICT accessibility, their confidence, level of involvement and learning support. Managers of the centres shared relevant information on institutional capacity, resource allocation, access policies, and the nature of professional development. This was very important, since ICT's integration into ABET cannot be viewed from a single perspective. This is according to Nchabeleng (2024), who states that digitalisation of community education and training encounters barriers for both educators and learners. This idea is further supported by Kafu-Quvane (2021), who discusses educators' experiences with ICT integration.

3.4.2 Data Collection

Data were collected using two complementary sources: semi-structured face-to-face interviews and documentary analysis. Separate interview schedules were used for adult educators, adult learners and centre managers, with questions aligned to the research objectives on ICT availability and access, classroom use, pedagogical value, professional development and institutional support. The interview schedules are included in the appendices. Documentary analysis focused on selected policy, strategy and sector documents relevant to digital skills, post-school education, CET and educator ICT competence; the documentary analysis matrix is also provided in the appendices. Together, the sources enabled comparison between stakeholder accounts and the policy and institutional context (Bell, Bryman and Harley, 2022; Bowen, 2009).

The interviews were conducted in person at the selected CLCs. Interviews were conducted in private rooms where confidentiality could be maintained and distractions eliminated. All interviews were not conducted using the Internet or the telephone as face-to-face interviews were believed to be the best way to conduct the study. Adult educators, adult learners, and centre managers were interviewed separately to prevent any power dynamics influencing the interviews. The reason was that interviewees needed the freedom to express their opinions without feeling influenced by others, such as their colleagues, managers, or other learners.

Interviews lasted between 45 minutes and one hour, depending on the intensity of the participant's opinions.

Prior to each interview, participants were fully briefed on the research purpose, that participation is voluntary and were apprised of withdrawal provisions and confidentiality safeguards. Informed consent was sought from the participants prior to conducting the interviews. The interviews were recorded with participants' consent to capture responses accurately for later transcription and analysis. Additionally, field notes were kept during and soon after the interview sessions to record the context and analysis that may be gained. As noted by Bell et al. (2022), recording and documentation increase the validity of qualitative data. The recording and documentation process in this study helped capture the oral aspects and context of ICT adoption in the two centres.

Through interviews, the researcher had the opportunity to pose probing questions when there were uncertainties about participants' answers. As a result, the participants were encouraged to give real-life examples of the use of ICT tools, the barriers they encountered, and the impact of professional development on their practice. While interviewing adult educators, information was sought regarding lesson preparation and planning, teaching methodologies, as well as ICT training. Similarly, adult learners were asked about their access to and exposure to ICT tools. Lastly, centre managers were asked about infrastructure, the provision of resources, institutional rules, and support for adult educators. Such differentiation helped ensure that the information elicited from participants addressed their specific roles in the CLC system. Furthermore, the method was in keeping with the research approach adopted, as it helped determine how different actors experienced tools, rules, and other aspects of the activity system.

The design of the data collection methods was intended to yield valid and relevant qualitative data on the integration of ICT into ABET. By separating the groups, the validity of the answers received was enhanced, as the reduced likelihood of learners refraining from criticising educators in the presence of the latter reduced the risk of bias. Interviews being conducted in private rooms ensured that no participant felt uncomfortable sharing information about constraints at the institution or development requirements in his or her professional field. The choice of face-to-face interviews facilitated greater engagement and enabled an adaptable response to participants' explanations. Overall, the interview methods were suitable for studying ICT integration as a contextual, institutional, and pedagogical phenomenon.

3.4.3 Data Processing

The interview data were systematically processed to ensure that the analysis was clear, structured and aligned with the research questions. All recorded interviews were transcribed to accurately capture participants' responses. The transcripts were then checked against the audio recordings to correct transcription errors and to ensure that participants' meanings were not misrepresented. Field notes were also reviewed alongside the transcripts to strengthen the contextual understanding of the data. Participants' names and the names of the centres were coded to protect privacy during analysis. The two centres were coded as Centre A and Centre B, while participants were assigned codes indicating whether they were adult educators, adult learners or centre managers. Bell, Bryman and Harley (2022) explain that qualitative data processing requires careful organisation, transcription, and data preparation before interpretation.

Data transcription and coding were conducted manually using the six-phase thematic-analysis logic associated with Braun and Clarke (2006). ATLAS.ti had been considered at the planning stage as a possible organisational aid, but the final analysis was conducted manually because direct engagement with the relatively small, bounded data set enabled close comparison across participant groups and cases. The decision concerned the mode of data organisation rather than a change in analytical method: software would not have performed the interpretation. To strengthen transparency, the researcher maintained an audit trail comprising transcript checks, coding notes, code-to-theme decisions, cross-case comparisons and records of theme refinement. The staged coding process is described below and was further supported by a documented analysis matrix (Naeem et al., 2023).

Transcripts of the interviews underwent systematic analysis to identify recurring themes regarding the availability and access to ICT, the use of ICT in the classroom, professional development, organisational support, and the importance of ICT in education. The codes and themes were manually organised into groups to connect their results with the objectives set forth by the study. This step helped the researcher engage directly with the material and interpret it, while considering participants' experiences. As noted by Bell et al. (2022), while the software can assist with organising the data, interpretation is the researcher's responsibility.

The data were analysed using theory-guided thematic analysis. The initial analysis began inductively, with the researcher identifying codes and categories emerging from the interview transcripts rather than applying a mechanical, fully predetermined coding framework.

However, the analysis was not entirely inductive, as Activity Theory and Diffusion of Innovation Theory guided the interpretation of the identified themes. Activity Theory assisted the researcher in understanding ICT integration by examining the interrelationships among tools, rules, subjects, community, object and division of labour. Diffusion of Innovation Theory supported the interpretation of educators' adoption perceptions, including usefulness, compatibility, complexity, trialability and observability. The use of these theories was justified because ICT integration in ABET is both an institutional process shaped by lived experiences and an educator-adoption process shaped by perceptions of technology. Kafu-Quvane (2021) found that educators' experiences of ICT integration are shaped by classroom environments and institutional contexts, while Abel, Tondeur and Sang (2022) show that educators' perceptions play an important role in explaining ICT integration into teaching practice.

Coding was conducted in stages. Firstly, the researcher read each transcript several times to become familiar with the data and to identify recurring statements. Secondly, preliminary codes were developed from sections of the text related to the research questions, including ICT tools used, restrictions imposed, lesson preparation, classroom use, learner involvement, assessment support, educator development and managerial support. Thirdly, similar codes were grouped into categories and then refined into broader themes. These themes included the availability and accessibility of ICT tools, patterns and levels of ICT integration, the pedagogical value of ICT use, and ICT-related professional development and institutional support. Comparisons were made between the two centres, across participant groups and across cases. Land's (2021) work on adult educators in South African community colleges was useful in interpreting differences within the institutional context of adult education.

In the final phase of data processing, the themes were reviewed, refined, and labelled to ensure they accurately represented the data and addressed the research objectives. Excerpts from the interview transcripts were selected to illustrate the identified themes. In addition, the researcher compared themes across adult educators, adult learners and centre managers. For example, educators' views on ICT access were compared with learners' views on ICT use and managers' views on resource allocation within the centres. This comparison strengthened the internal consistency of the findings and reduced overreliance on individual participant statements. Finally, the researcher cross-referenced the themes with existing theory and literature on ICT integration, digital competence and adult education. According to Nyathi and Joseph (2024), the digital proficiency of the teaching process will be influenced not only by the training educators receive but also by the institutional support provided to educators. However,

according to Nchabeleng (2024), the digitalisation of the community-based learning process depends on the obstacles faced by learners and educators.

3.4.4 Document Analysis

In addition to semi-structured interviews, the study used document analysis as a supplementary qualitative data source. The purpose was not to treat published literature as a second literature review, but to examine authoritative policy and strategy documents that shaped the institutional context in which ICT integration occurred. Document analysis enabled the study to compare formal expectations regarding digital skills, post-school/community education, educator capability and digital inclusion with the experiences reported by participants (Bowen, 2009).

Document analysis is one of the accepted qualitative research methods aimed at uncovering the motivations and influences of institutions on educational practice (Bowen, 2009). This type of qualitative research supported the data collected during interviews with ABET educators, learners, and centre management.

3.4.4.1 Selection of Documents

Publicly accessible online documents alone were used to provide clarity and ensure ethics compliance. The online documents were chosen purposefully with respect to the following criteria:

- The use of ICTs in education,
- ABET and CLCs,
- The professional development of educators in digital learning environments, and
- Digital access and digital divides in South Africa.

The document corpus included:

- National education and ICT policy documents,
- Government strategy frameworks related to digital learning and adult education,
- Reports addressing ICT access, infrastructure, and inequality, and
- Open-access international policy and research reports on ICT in adult education.

The core documentary corpus comprised the Department of Communications and Digital Technologies' National Digital and Future Skills Strategy (2020), the Department of Higher Education and Training's White Paper for Post-School Education and Training (2013), the ETDP SETA report on Adult and Community Education Training Colleges (2021), and UNESCO's ICT Competency Framework for Teachers (2018). These documents were selected because they directly addressed digital capability, post-school/CET positioning, institutional development or educator ICT competence and therefore provided a policy-context benchmark for interpreting the two cases.

3.4.4.2 Procedure for Document Analysis

The analysis of documents was done systematically and iteratively. In the first step, appropriate documents were selected and accessed from the websites of governments and international organisations. Each document was read multiple times to ensure that all details were understood, including what it contained and its purpose. This was done especially in relation to issues of ICT access, educator training, infrastructure, and adult learning.

Afterwards, each document was thematically coded using an inductive method. The initial codes included issues of ICT availability, support for policies, educators' capacity-building, and difficulties and inequities. These codes were grouped into broader themes related to research on the condition of ICT use in CLCs and the factors affecting it.

Finally, documentary findings were compared with interview themes to identify convergence, divergence and policy-practice gaps. The documents were not used to verify whether a particular educator used ICT in a particular lesson; instead, they provided an independent contextual source against which claims about access, professional development, institutional responsibility and digital inclusion could be interpreted. This form of triangulation strengthened contextual credibility while preserving the interviews as the principal source of evidence about lived teaching and learning practices.

3.4.4.3 Role of Document Analysis in the Study

Policy and strategy documents were analysed as supplementary documentary evidence, while peer-reviewed academic literature remained part of the literature review and discussion rather than the empirical data set. This distinction separated empirical document analysis from theoretical literature synthesis. The documentary evidence was coded around policy intentions

for digital access, educator capability, institutional responsibility and inclusion, then compared with interview themes in Chapters 4 and 5.

As far as the documentary sources considered before are concerned, they relate to themes of national digital policies, adult and community education, the use of ICT, educators' digital competence, and digital inclusion. Documentary sources were effective tools for shaping respondents' experiences regarding topics such as digital transformation, adult education, and CLCs. Firstly, the document ‘National Digital and Future Skills Strategy’ provided relevant information on the development of digital competencies among people living in South Africa (Department of Communications and Digital Technologies, 2020). Secondly, the document ‘Adult and Community Education Training Colleges’ by ETDP SETA helped gain some insight into the situation in the sub-sector (Education, Training and Development Practices Sector Education and Training Authority, 2021). Lastly, academic literature on CLCs and their digitalisation helped reveal structural barriers to the use of ICT in adult education (Belete et al., 2022). Therefore, documentary sources could help shape the research but were supplementary to interviews.

The documentary evidence therefore played a bounded triangulation role: it contextualised and challenged the interview accounts without replacing them. Chapter 4 presents a concise documentary synthesis showing where policy intentions converged with or diverged from the conditions reported in Centres A and B, while Chapter 5 integrates these contrasts into the theoretical discussion.

3.5 Trustworthiness

Trustworthiness was addressed through credibility, dependability, transferability and confirmability. Credibility was enhanced through this study by emphasising the participants' views as the main foundation of the research findings. Through active participation in the two CLCs, the researcher gained an understanding of the research environment and earned the participants' trust. As stated by Dang, Van Nguyen, and Tran (2024), active participation in research settings yields richer data. Participants were also asked to verify transcripts and preliminary interpretations. Member verification reduced the risk of misinterpretation and strengthened the credibility of the qualitative findings. Triangulation across interview transcripts, field notes, and audio recordings further reduced bias and grounded interpretations in participants’ accounts.

The research's credibility has been enhanced by documenting the processes followed in detail. In this case, an audit trail has been created that clearly outlines issues such as sampling, interviewing, transcription, coding, theme development, and theme interpretation. From the audit trail, it is clear the methodological processes that were used and how the decisions were reached. Bell et al. (2022) note that to enhance the credibility of qualitative research, there must be an audit trail that describes the research process in detail. Peer review of the coding scheme and themes was used to check that interpretations were reasonable.

Transferability was considered in this study through a detailed description of the research context and the data collection procedure. According to Hossain, Alam, and Ali (2024), thick description enables readers to evaluate the transferability of qualitative results. In this case, the inclusion of adult educators, adult learners, and centre managers enabled diverse viewpoints on ICT integration in CLCs. Qualitative research cannot generalise results statistically, but a detailed description allows a reader to evaluate the relevance of those results to their setting. This agrees with Fife and Gossner (2024).

Confirmability has been enhanced through reflexivity, transparency, documentation, and the verification of findings. The researcher documented personal assumptions, methodological decisions, and reflections made during data collection and analysis. Reflexivity helped minimise the risk of researcher bias affecting the interpretation of participants' experiences. The participants' experiences have been an integral part of the analysis, which relied on direct quotations to develop interpretative themes. Peer debriefing and member checking also reinforced the study's confirmability, as they facilitated data-driven findings rather than the researcher's assumptions.

3.6 Ethical Measures

The study adhered to ethical principles to protect participants' rights, dignity, privacy and well-being. Ethics approval was granted on 13/08/2025 under reference number 7795. Permission to conduct the study was also obtained from the relevant institutional and departmental authorities before data collection commenced. Qualitative research ethics require institutional authorisation before participants are approached, particularly when the research involves human participants and takes place in institutional settings. Participants were informed about the purpose of the study, the nature of their participation, the data collection procedures, possible risks and their right to withdraw from the study without penalty. Participation was voluntary, and informed consent was obtained before each interview.

Confidentiality and anonymity were maintained throughout the study. Participants' real names were not used in transcripts, analysis or reporting. Instead, participants were identified through codes, while the two CLCs were referred to as Centre A and Centre B. This reduced the risk of identifying participants or institutions. The audio files, along with transcripts and notes, were properly safeguarded. Passwords were applied to all electronically stored files, while printed documents were kept in a readily available place, in a cabinet accessible only to the researcher.

In addition, non-maleficence was another ethical principle followed during the research. The interviews were held to avoid offending anyone. Participants were informed that they could refuse to answer any question or withdraw from the study at any stage. Because the study involved educators, learners, and centre managers, interviews were conducted separately to reduce potential power dynamics and allow participants to express their views honestly. The researcher also clearly stated the study's purpose and avoided misleading participants about how the information would be used.

The study was guided by the principle of beneficence. Although participants did not receive direct material benefits, the study aimed to contribute to a better understanding of ICT integration in CLCs. The findings may assist policymakers, centre managers, and adult educators in strengthening access to ICT, pedagogical ICT use, and professional development in adult education. Ethical conduct was therefore maintained by balancing the need for knowledge generation with respect for participants' autonomy, confidentiality and well-being.

3.7 Summary

This chapter outlines the methodology and design employed in the study of ICT integration in education at two CLCs for adult basic education and training in South Africa. An interpretivist qualitative research method, along with the multiple-case study design, was used in the study. These methodologies were selected because they aligned with the research purpose, which focused on the perspectives of adult educators, learners, and centre managers regarding their own use of ICT in the context of their CLC. The last aspect discussed was the researcher's positionality.

This chapter also described the purposive sampling of 10 participants 4 adult educators, 4 adult learners and 2 centre managers and justified the sample in relation to information richness, cross-case comparison and thematic sufficiency. Data collection combined semi-structured face-to-face interviews with supplementary document analysis. Data processing involved

verbatim transcription, anonymisation, staged manual coding, cross-case comparison and theory-informed thematic analysis, supported by an audit trail and documentary analysis matrix.

The following trustworthiness issues: credibility, reliability, confirmability, and transferability were considered when dealing with the issue of trustworthiness. For credibility, transcriptions, respondents' verification of the transcriptions, and direct quotations were used in the presentation of the results. The member-checking procedure verified the transcriptions, and no major changes were needed to the collected data. Reliability was enhanced through an audit trail that documented sampling, interviews, transcription, coding, and theme generation.

This study also touched on ethical issues. Informed consent was obtained from all subjects before any data collection. All subjects participated voluntarily; their right to withdraw at any time without punishment was highlighted to them. Confidentiality and anonymity were assured using codes to identify subjects and designate the centres as Centre A and Centre B. Data collected were stored on password-protected, encrypted computers, while printed copies were stored in a lockable filing cabinet, accessible only by the researcher. Ownership of the data belongs to the university, but the researcher is responsible for safekeeping, presentation, and confidentiality. The data will be kept for 5 years after the conclusion of the research, after which it will be deleted permanently.

CHAPTER 4: DATA PRESENTATION AND ANALYSIS

4.1 Introduction

This chapter presents and analyses the empirical findings on ICT integration in teaching and learning at the two selected Community Learning Centres. The principal evidence comes from semi-structured interviews with adult educators, adult learners and centre managers, supplemented by document analysis used to examine the policy and institutional context. Findings are organised around the research questions and four major themes: ICT availability and accessibility, patterns and extent of integration, perceived pedagogical value, and professional development and institutional support. The chapter provides concise interpretive signposting, while the fuller theoretical discussion is developed in Chapter 5.

A qualitative interpretivist approach was used to analyse data collected from interviews with the research participants. According to Lincoln and Guba (1985), interpretivism focuses on the interpretation of human experiences from the point of view of the individuals whose experiences are being considered. In this case, the individuals are adult educators, adult learners, and the centre manager.

Thematic analysis was chosen to analyse the collected data in accordance with the interpretivist philosophy of science. The inductive approach to coding and categorising data has enabled the researcher to detect themes and meanings based on the information in interview transcripts. According to Braun and Clarke (2006), such an approach to data analysis provides researchers with opportunities to detect themes that emerge directly from the data, without any preliminary assumptions about the categories and themes to be identified. In addition, such an approach allows for the respectful consideration of participants' views, voices, and opinions, as it is more flexible and adaptive than a deductive approach, in accordance with the guidelines provided by Lincoln and Guba (1985). Analysis of the collected data is based on four main themes related to the research questions raised. Thus, all components of the research project are interrelated through these themes and can be analysed together. These findings are interpreted and discussed further in Chapter 5.

4.2 Demographic Profile of Participants

This section describes the participants' demographics. The aim of this section is to showcase the participants' backgrounds to position their viewpoints relative to their roles, level of learning, and experience in the CLC environment. In qualitative research, demographic details are presented in prose and are not subjected to statistical examination. Out of the three primary

stakeholder categories, adult educators, adult learners, and centre managers, the study had a total of 10 participants.

4.2.1 Participant Categories and Roles

The group included adult educators (n = 4), adult learners (n = 4), and two centre managers (n = 2). This group was purposeful in its attempt to gather diverse viewpoints on the integration of ICT at the classroom, learner, and institutional levels. Adult educators commented on the use of ICT and instructional practices and provided insights from professional training. The adult learners viewed ICT from a personal experience perspective, considering their access to it, their involvement with it, and its learning effects. The centre manager's views were more institutional in nature and focused on the centre's organisational structure and resource allocation, including whether there is conformity with the departmental guidelines.

Table 1: Distribution of Participants by Role

Participant Category	**Number of Participants**	**Description of Role**
Adult Educators	4	Responsible for classroom teaching across ICT and non-ICT learning areas
Adult Learners	4	Enrolled in ABET Level 4 and/or ICT Level 4 learning areas
Centre Managers	2	Oversight of institutional management, ICT resources, and policy alignment
Total	**10**	—

The formation of participants into categories such as adult educators, adult learners, and centre managers is necessary to understand the multiple dimensions of ICT integration in CLCs. The involvement of these participants in the study enables an integrative approach to ICT integration from diverse perspectives. Information from adult educators provides insights on how ICT can be implemented in teaching activities, whereas information from adult learners provides insights on ICT accessibility and use. Centre managers play a critical role in gaining a broad institutional view of ICT availability.

4.2.2 Teaching Experience of Adult Educators

The studied adult educators showed considerable teaching experience in the ABET and Community Education and Training (CET) fields. Their years of service at the chosen CLCs spanned 2004 to 2010, reflecting a sustained commitment to adult education. Such experience helped adult educators profoundly appreciate the various traditional teaching methods and the new expectations for teaching and learning, particularly regarding the use of ICT. Given their extensive experience in the ABET context, they were well-positioned to consider the changes, constraints, and opportunities related to the use of technology in teaching and learning.

Table 2: Teaching Experience of Adult Educators

Educator Identifier	Year Commenced Teaching at CLC	Approximate Years of Experience
Participant 2	2004	20+ years
Participant 3	2009	15+ years
Participant 9	2009	15+ years
Participant 10	2010	14+ years

The wealth of teaching experience among the adult educators, evident in Table 2, is highly informative for evaluating the role of ICT within the framework of history. As most educators have more than 14 years of teaching experience, they can efficiently compare conventional teaching strategies against the more contemporary ICT-oriented practices. The wealth of knowledge about adult learning accumulated by educators over years of teaching enables them to provide a deep analysis of both the obstacles and benefits of introducing ICT into the existing pedagogy.

4.2.3 Learning Areas and Educational Background of Educators

Adult educators worked in several learning areas, including Mathematics, Communication in English, Sewing, Wholesale and Retail, and Information and Communication Technology. Variety enabled juxtaposing ICT-based topics with non-ICT-based topics. Though ICT educators' comfort with technology was higher, confidence and initiative varied among other

educators. The variety of learning topics was important for illustrating differences in the adoption of ICT by topic.

Table 3: Learning Areas Represented by Educators

Educator Identifier	Learning Area(s) Taught
Participant 2	Mathematics (ABET Level 4)
Participant 3	English, Life Orientation, Ancillary Health Care
Participant 9	Communication in English, Sewing (Level 3)
Participant 10	Information and Communication Technology (ICT Level 4)

In Table 3, educators' subject fields are important for understanding the uneven integration of ICT across them. Subjects with ICT concentration, for instance, ICT Level 4, are more inclined to integrate ICT into their teaching methods because these educators are more confident in their use of technology. Adult Educators involved in subjects that do not relate to ICT, such as Mathematics and English, have varying levels of comfort and approaches to ICT use.

4.2.4 Profile of Adult Learners

Adults participating in the research had been enrolled at levels 4 of ABET and ICT, and some had previously completed skill-acquisition courses such as sewing and leatherwork before joining. The participants came from different educational backgrounds, including some who had dropped out of school, others who had completed matric, and those with prior exposure to Technical and Vocational Education and Training Colleges. Adults varied in tenure within the CLC from 2015 to 2025, showing that some spent only a short time in adult education classes, while others spent a relatively longer time. It was essential in demonstrating how ICT supports different learners.

Table 4: Adult Learner Academic Profile

Learner Identifier	Year of Entry	Programme / Learning Area	Prior Educational Background
Participant 6	2015	ABET Level 4, all learning areas	Incomplete schooling
Participant 7	2025	ABET Level 4 + Sewing Skills	Adult basic education

Learner Identifier	Year of Entry	Programme / Learning Area	Prior Educational Background
Participant 8	2024	ICT Level 4 only	TVET exposure
Participant 5	2024	ABET Level 4, all learning areas	Incomplete schooling

This is due to the broad range of educational qualifications held by these learners, as evident in Table 4. Adult learners who have received partial education or have previously been enrolled in Technical-Vocational Education and Training colleges differ in their proficiency with ICT and thus in their ICT usage skills. This difference in the learner's profile is critical for ICT utilisation, as this tool may help address the unique learning abilities of different learners in adult education. From the study results, ICT may serve as a useful tool for meeting the varied learning needs of adult learners, but this would be possible only if the tool accommodates differences in ICT knowledge among learners.

4.2.5 Institutional Role of the Centre Manager

The participant serving as centre manager undertook both managerial and administrative responsibilities at the CLC, including managing the centre's infrastructure, personnel, and policy alignment. The involvement of the centre manager in the departmental training activities and the roll-out of the infrastructure helped the study gain an organisational perspective on the integration of ICT. This role was especially significant in identifying systemic issues, funding structures, and the voluntary nature of the policy pertaining to the integration of ICT at the centre.

Table 5: Centre Managers' Institutional Role

Participant Identifier	Position	Key Responsibilities
Participant 1	Centre Manager	ICT infrastructure oversight, staff development, policy alignment, and reporting to DHET
Participant 4	Centre Manager	ICT infrastructure oversight, staff development, policy alignment, and reporting to DHET

The roles and duties of the centre manager, as described in Table 5 above, are crucial for providing the infrastructure and policy framework for the adoption of ICT in institutions. Monitoring and coordination of ICT resources and departmental policies provide insight into the structural constraints and enablers associated with ICT use in the CLCs. The participation of centre managers in training processes and in decision-making regarding resource allocation provides the organisational perspective needed to comprehend the structural issues that support or constrain ICT integration. This is critical for interpreting the results provided by educators and learners.

4.2.6 Relevance of Demographic Characteristics to the Study

The participant's demographic features significantly influence how the findings in this chapter are understood. The data capture the intricacy of ICT integration in CLCs, driven by outstanding educators, diverse learner types, and varied institutional leadership perspectives. Such characteristics contributed to the development of the theme of accessibility, usage patterns, instructional value, pedagogy, and professional growth, and helped contextualise the thematic analysis that follows.

4.3 Overview of Emerging Themes

This chapter utilises thematic analysis to describe and interpret the results from the semi-structured interviews with adult educators, adult learners, and centre managers at the CLCs. Using Braun and Clarke’s (2006) thematic analysis, the researcher sought to describe and interpret the qualitative data collected at the CLCs, focusing on participants' experiences with integrating Information and Communication Technology (ICT) into adult basic education and training (ABET) teaching and learning.

These interviews provided the main source of information for creating themes, while document analysis was used to verify them. The researcher read all transcripts repeatedly to become familiar with the collected data. Statements related to ICT were then identified through the open coding process. The author grouped and categorised similar codes and refined this categorisation through constant comparison with the other transcripts. In addition to the participants' individual experiences, these statements reflected the group's experiences. The major themes and sub-themes presented in this chapter are a product of this process.

Table 6: Emerging Themes, Core Focus, and Key Findings

Major Theme	**Core Focus of the Theme**	**Key Participant Perspectives Informing the Theme**	**Related Research Question(s)**	**Tensions/Contradictions or Unexpected Findings**
Availability and Accessibility of ICT Tools in the CLCs	Examines the presence of ICT infrastructure, access arrangements, sharing practices, and infrastructural constraints affecting use	Educators (access to tools, preparation constraints), Learners (availability, sharing, functionality), Centre Managers (institutional provision and controls)	What types of ICT tools are currently available and accessible to adult educators in CLCs?	Despite the presence of ICT infrastructure, educators reported both abundance and scarcity; some centres had advanced tools, while others had only basic resources, resulting in inconsistent access.
Patterns and Extent of ICT Integration in Teaching and Learning	Explores how frequently and in what ways ICT is used, highlighting administrative use, limited classroom integration, and subject-specific practices	Educators (teaching practices and initiative), Learners (classroom experiences), Centre Manager (observed usage patterns)	How frequently, in what ways, and to what extent do adult educators integrate ICT into their teaching and learning practices within the CLCs?	ICT use was predominantly administrative, and there was a lack of systematic integration in classroom teaching, with usage varying significantly across subjects.

Major Theme	Core Focus of the Theme	Key Participant Perspectives Informing the Theme	Related Research Question(s)	Tensions/Contradictions or Unexpected Findings
Perceived Pedagogical Value of ICT Integration	Captures perceptions of ICT's contribution to engagement, understanding, inclusivity, and learning outcomes	Educators (instructional value and learner response), Learners (motivation, comprehension, achievement)	What are adult educators' perceptions of the pedagogical value and effectiveness of ICT integration in enhancing teaching and learning outcomes?	While ICT was seen as engaging and motivating for learners, its pedagogical benefits were limited by inconsistent integration and insufficient formal guidance.
ICT-Related Professional Development and Institutional Support	Analyses availability, relevance, and gaps in training, as well as institutional support, policy guidance, and accountability mechanisms	Educators (training access and needs), Centre Manager (policy alignment and support structures)	What ICT-related professional development opportunities are available to adult educators in ABET, and how relevant and frequent are these opportunities?	Despite the availability of some professional development opportunities, there were gaps in the alignment between the training and actual classroom needs, with a lack of continuous, pedagogically focused support.

The inclusion of a column, "Tensions/Contradictions or Unexpected Findings", in the table reveals the complexity and complications that arise in the integration of ICT in CLCs. These contradictions provide another angle on the challenges experienced by both the adult educators and learners in this kind of environment. For example, as noted in the section "Availability and Accessibility of ICT Tools," despite the presence of ICT in this kind of environment, ICT use in CLCs was contradictory; while some centres had advanced ICT, others lacked sufficient ICT to meet their requirements. This becomes vital since it shows that the presence of ICT alone does not suffice in such learning institutions. Within the section "Patterns and Extent of ICT Integration," it was found that ICT was primarily used in administrative functions within the learning institutions rather than in classroom teaching. This shows the importance of an

institutional framework for ensuring the continuous, strategic implementation of ICT in the classroom. Finally, the "ICT-related Professional Development and Institutional Support" thematic group addresses the mismatch between available training and educators' pedagogical requirements. The contradiction between ICT training and corresponding pedagogical development underscores the importance of a well-defined programme for educators' professional development. This is because ICT integration cannot succeed without enough people who know how to incorporate it into teaching.

The comparison therefore revealed a policy-practice gap. Documentary sources established a clear expectation that digital capability, inclusive access and educator competence should form part of educational transformation, while interview data showed that implementation at centre level remained conditional on functionality, access rules, personal devices, connectivity and pedagogically focused support. The documents converged with participants on the importance of ICT but diverged from the uneven conditions under which that importance could be realised. This documentary synthesis was used as triangulation of context rather than as proof of classroom behaviour; direct claims about teaching practice remained grounded in participant accounts.

The document analysis identified four recurring contextual expectations. First, the National Digital and Future Skills Strategy framed digital capability as a national participation and development priority (DCDT, 2020). Second, the White Paper for Post-School Education and Training located community education within the post-school system and emphasised expanded, integrated provision (DHET, 2013). Third, the ETDP SETA report foregrounded capacity and development needs within adult and community education (ETDP SETA, 2021). Fourth, UNESCO's ICT competence framework positioned educator capability and pedagogical application as important conditions for effective technology use (UNESCO, 2018).

4.4 Availability and Accessibility of ICT Tools in CLCs

4.4.1 Presence of Basic ICT Infrastructure at CLCs

The interviews showed that at least some ICT infrastructure was in place for the chosen CLCs. Some of the available resources included computer labs, PCs, laptops, printers, photocopiers, data projectors, smart boards, routers, and Wi-Fi-enabled screens. The presence of ICT resources is not a novel phenomenon for these CLCs. However, it can also be observed that resource availability differed between the two institutions where the research was conducted;

one CLC had a wider range of ICT resources, whereas the other had fewer options. From the point of view of Activity Theory, the mentioned ICT was available in the activity systems but was not necessarily accessible or used properly in classrooms.

> *"The CLC has a number of ICT tools, such as desktop computers in the computer lab, a data projector, laptops, a printer, smart TV screens, and Wi-Fi internet access."* (Participant 2)

> *"25 computers in a computer lab, photocopy machine, printer, router with working Wi-Fi, 4 laptops, and a living lab (smart screen, 3D printer, digital camera, and projector)."* (Participant 1)

> *"Available ICT resources consist of computers, a projector, a display screen, and a computer laboratory."* (Participant 3)

> *"At the centre, I have use of a desktop computer in the computer lab, Wi-Fi, printers, and a photocopy machine."* (Participant 6)

> *"The Community Learning Centre has a working printer, projector, and some basic computers."* (Participant 5)

These quotes indicate that participants were able to identify the ICT tools they could see and use in the centres. At the same time, the ICT infrastructure varied across participants in the study, depending on which centre they came from and the type of learning activities they were involved in. Participants would talk about more advanced tools – smart screens and other specialised devices, as well as simply refer to computers, printers, and projectors, thus indicating that there were differences in the notion of "available ICT." From the Activity Theory standpoint, the tools provided in one activity system differed from those in the other. As a result, there are different possibilities for using ICT for teaching purposes in the two activity systems studied here.

4.4.2 Unequal Access to ICT Tools Across Learning Areas and Users

According to the interview findings, there was no equal distribution of ICT tools across all areas of learning. ICT was more evident in learning areas related to computers, whereas learners and instructors from other learning areas had limited access to it. Learners from ICT-related learning areas seemed to have greater access to computers than other users who had access through the centres, with bookings and controlled access. The implication of such an unequal distribution of ICT tools is a gap not only in accessibility but also in regulations

governing how learners and instructors could use the resources, depending on the area of learning. According to Activity Theory, a conflict existed regarding the ICT tools in the centres and how they could be accessed by learners and instructors.

> *"The listed resources are aimed primarily at the learners in the computer learning area and their educators."* (Participant 4)
>
> *"Computers are available to learners taking ICT Level 4." (Participant 5)*
>
> *"They have restrictions on their use."* (Participant 3)
>
> *"One limitation is that these resources cannot be taken home, as they are property of the Centre."* (Participant 2)
>
> *"Learners often have to share computer workstations, but not all learners are willing to share."* (Participant 6)

The quotations show that access to ICT depended on the program's focus, the rules set out for the centre, and the use of the resource on a communal basis. ICT-focused areas seem to have more direct access to computers than other areas. The inability to take the technology home suggests that access was mainly at the centre level, which could have affected preparation and practice. The sharing of computer workstations by learners suggests that access to ICT resources was never individualised. In terms of Activity Theory, this observation suggests a division of labour, as access varied from one user at the centre to another based on their roles and the learning area they were in.

4.4.3 Shared and Regulated Use of ICT Resources

ICT resources in the selected centres, as reported by the interviewees, were always shared and accessed through processes such as signing in to a register, scheduling equipment use, following procedures, and using the available ICT resources according to a timetable. ICT resources in this case seem to be accessible only under certain circumstances and do not function like freely accessible classroom materials. The processes appear to have ensured accountability and control over resources. On the other hand, these regulations appear to have affected the accessibility of ICT to educators and learners when needed. In terms of Activity Theory, the above discussion focuses on the interplay between rules and tools, where access to ICT resources was determined by centre policies.

"Staff members can access all the mentioned resources as long as they fulfil the necessary register upon checking them out." (Participant 2)

"Measures exist that govern their use." (Participant 3)

"Developing a specific timetable for the use of common resources would allow for the lessening of accessibility restrictions on devices." (Participant 4)

"Shared resources may not always be available at a given moment." (Participant 3)

"Sometimes, learners are assigned to be in groups so as to minimise sharing and grant each learner a chance." (Participant 6)

According to participants' accounts, access to shared ICT was controlled both formally and informally. Registers and policies were among the methods used to control access, and time-tabling was recommended to ensure predictability in access. The findings reveal that there was no availability of shared resources at any given time, which consequently hindered the immediacy of ICT use. Grouping learners based on limited access can be seen as another strategy centres adopted to address the issue of resource sharing. Within the context of Activity Theory, both rules and division of labour helped to mediate the relationships between the ICT tools and the object of helping the teaching and learning processes.

4.4.4 Infrastructure Constraints Affecting Accessibility

Limitations caused by infrastructure issues affecting the usability of the ICT equipment were also found. The discovered limitations included faulty computers, poor Wi-Fi signal, poor internet connectivity, inability to use the equipment outside the centre, and delays in maintenance services. Although some infrastructure facilities were present in the learning centres, participant interviews indicate inconsistent functioning of these facilities. The mentioned limitations might have prevented both educators and learners from engaging in various activities, such as working in class, self-study, and conducting internet research. The current section reveals an inconsistency within the ICT activity system. Tools are available, but their functionality and accessibility are not.

"Some of the computers are faulty, and it takes time for them to be repaired." (Participant 7)

"Wi-Fi sometimes can be slow if there's high usage." (Participant 1)

"There is no internet access, and certain ICT equipment cannot be taken home." (Participant 4)

"The absence of Wi-Fi connectivity significantly limits the effective integration of ICT." (Participant 5)

"Maintenance relies solely on our educator, who has to make time to fix them." (Participant 8)

The above quotes show how the constraints related to infrastructure were perceived differently by the centres and participants. Malfunctioning computers meant fewer machines were available, whereas a lack of internet connectivity hindered access to online information. Not having the capacity to carry equipment outside the centre also meant limited availability. In one case, it was noted that the equipment repair had to be done by the educator, indicating that technical assistance was not always available. From the perspective of Activity Theory, this can be linked to the concept of the division of labour, since the responsibility for ICT maintenance was left to educators, not technicians. This therefore means that besides availability, functionality and connectivity of ICT tools also played a major role in their accessibility.

Analytically, Theme 1 shows that access was mediated by rules, functionality and allocation rather than by physical presence alone. This pattern anticipates the Activity Theory discussion in Chapter 5, where the contradiction between available tools and restrictive or unreliable conditions is interpreted as conditional presence.

4.5 Patterns and Extent of ICT Integration in Teaching and Learning Practices

Table 7: Integration Patterns at Centre A vs Centre B

Aspect	**Centre A**	**Centre B**
ICT Resources Availability	Extensive resources (smart boards, 3D printers, etc.)	Limited resources (basic computers, projectors)
ICT Use in the Classroom	Frequent use, integrated into most subjects	Primarily used for administrative tasks, with limited classroom integration
Frequency of ICT Use	Daily use in lessons and assignments	Weekly use, mostly for administrative purposes
Educator Training and Support	Regular professional development workshops	Sporadic, on-demand training sessions

Aspect	Centre A	Centre B
Internet Connectivity	High-speed, reliable internet	Unstable, slow internet connection
Learner Engagement with ICT	High engagement in ICT-based activities	Low engagement, mostly passive access
Institutional Support for ICT	Strong leadership and funding for ICT integration	Limited institutional support and funding

A few of the factors that may be attributed to the differences in ICT integration processes in Centre A and Centre B could be leadership, finance, and location, to mention a few. For instance, in Centre A, the leadership played a major role in ensuring that ICT integration took place through sufficient funding and the provision of appropriate technological resources such as smart boards, 3D printers, and fast internet access. Due to all these, ICT was regularly integrated into teaching in Centre A.

In contrast, Centre B lacked funding for ICT infrastructures; hence, only the basic equipment such as the projector and computer were present. Also, Centre B lacked institutional commitment to ICT and inadequate educator knowledge on how to use ICT, resulting in the use of ICT in administration and not in classroom instruction. Lastly, the poor internet connectivity also contributed to the failure to utilise the digital information, which resulted in little participation of the learners in the ICT-based instruction.

4.5.1 ICT Use Concentrated on Lesson Preparation and Administrative Tasks

From the interviews, ICT use in the chosen CLCs focused primarily on lesson planning, documentation, and administration. The adult educators indicated that they had used ICT for lesson plan preparation, typing documents, printing learning materials, copying handouts, and preparing materials for assessment purposes. It is important to point out that these ways of using ICT show that ICT was used during the lesson but more like a supporting tool rather than an integral tool in the classroom itself. Within Activity theory, ICT was used as a means of mediation, while the object of transforming teaching and learning through ICT was not evident in the findings.

> *"ICT is mainly used for learner research activities and for lesson preparation, such as typing documentation."* (Participant 3)

> *"I am able to develop lesson plans efficiently using a Word template."* (Participant 2)

"Educators mostly use [ICT] for basic activities such as photocopying documents or handouts and typing documents." (Participant 10)

"ICT is also used for photocopying and printing teaching and learning documents." (Participant 3)

The quotes above reveal that ICT has been considered useful for making educators' work easier and more effective. At the same time, it becomes clear that the most common application of ICT was in preparation and administration activities, rather than in direct classroom lessons. In this way, the information obtained reveals the instrumental nature of ICT incorporation into the centres, which was useful but had limitations in its practical use in the classroom. ICT made it easier for educators to organise their work.

4.5.2 Limited Classroom-Level Integration of ICT

The analysis shows that ICT integration in classroom teaching was rather low. Although some respondents discussed integrating ICT, such as video clips and computers, with projectors in individual cases, there is no evidence that ICT have been used across all aspects of learning. It seems that ICT integration in classroom settings has relied on educators' personal initiative, the availability of materials, and their competence in using those tools. Under Activity Theory, there was a clear contradiction between the availability of ICT and its use in classrooms.

"No clear mandate for us as educators to take on technology in our classrooms." (Participant 2)

"I have not used ICT directly in my teaching, but I have used it for lesson preparation." (Participant 3)

"ICT is used, but not very frequently." (Participant 4)

"Very limited even though the resources are available." (Participant 1)

From the above answers, it is evident that ICT has not been consistently utilised in classroom instruction. The responses indicate that some educators had never utilised ICT in their teaching, while others reported using ICT, but only to a very limited extent. The lack of policy as an influencing factor for classroom activities was also noted. The findings highlight the gap between having the ICT resource available and its utilisation in classroom instruction. However, this gap does not imply resistance towards ICT.

4.5.3 Subject-Specific and Practical Use of ICT

The findings that there was more integration of ICT in practical subjects where skill development is needed. For instance, participants mentioned ICT use in learning activities involving videos, projections, and screenshots on topics such as sewing, wholesaling, retailing, and ICT itself. It means that educators integrated ICT only when they needed it to demonstrate practical aspects of their subject matter. This finding indicates that when the objective of ICT use in class activities becomes clear and straightforward, it is easier to integrate ICT into those learning activities.

> *"The area in which I most often incorporate technology is when demonstrating practical aspects of sewing, which can be difficult to explain verbally alone."* (Participant 9)

> *"Our educator for wholesale and retail normally uses videos to demonstrate some business ideas."* (Participant 7)

> *"I use a projector to display my computer screen so learners can follow each step."* (Participant 10)

> *"Seeing a cashier working at the till made it easier to relate the theory to real workplace activities."* (Participant 6)

The use of ICT is demonstrated in the extracts, showing practical information in a meaningful way. The use of ICT is related to demonstrations, illustrations, and explanations. It was also noted that the use of ICT was useful when theories were being applied to practical scenarios. However, the use of ICT was not equally distributed but rather concentrated in certain subjects. This suggests that the use of ICT was most frequent in those cases where links were evident.

4.5.4 Reliance on Personal Devices to Supplement Institutional Gaps

The other trend in the data related to the use of personal devices to facilitate ICT activities. Some educators mentioned using personal laptops and mobile phone data to download materials, prepare lessons, and demonstrate content. It was also mentioned by the learners that they use personal mobile phones to access information or learning-related material outside the centre. In terms of Activity Theory, this finding highlights the conflict between the means of production and the division of labour. Where the centre facilities fell short or access to them was problematic, educators and learners had to rely on personal tools to facilitate ICT activities.

> *"If I want to demonstrate content, I use my own laptop and the Centre's projector."* (Participant 9)

"I use my personal modem to access the internet and download materials." (Participant 9)

"Learners are encouraged to use their mobile phones to search for relevant information." (Participant 10)

"At home, I only have access to a cell phone, as we do not have a computer or Wi-Fi." (Participant 6)

From the above quotes, it is evident that personal gadgets were significant tools that helped bridge ICT gaps at the centre. Educators used their own devices when the centre lacked equipment, and internet connection was necessary. Learners, on the other hand, relied on their mobile phones, particularly when away from the centre. Therefore, from the data presented above, ICT integration in teaching and learning was made possible through personal efforts. While personal initiative and the possession of personal gadgets helped ICT activities continue, it is also clear that ICT access varied depending on whether someone had those gadgets.

Analytically, Theme 2 shows that ICT integration remained largely preparatory, administrative and episodic. The pattern points forward to Chapter 5's analysis of the gap between adoption of technology for operational tasks and its sustained pedagogical use, including the role of educator agency and institutional support.

4.6 Perceived Pedagogical Value of ICT Integration in Adult Learning

4.6.1 Enhanced Learner Engagement and Motivation

ICT was usually seen as useful for enhancing learner engagement and motivation. Educators and learners found ICT-based lessons more stimulating than textbook-based and verbally delivered classes. Attention, concentration, and participation were among the characteristics participants mentioned when discussing ICT-enabled lessons. Nevertheless, such characteristics cannot be assumed to be objective, since they are simply what participants thought about engagement in ICT-enabled lessons. This is why it can be argued that ICT had a positive effect on the participants, even though the results need to be interpreted carefully, given factors such as novelty.

"Learners get bored when they are being taught through textbook, but when an educator changes to making use of a simple technology, they become engaged." (Participant 2)

"Learners like technology, and it allows them to engage more easily in the learning process." (Participant 3)

"Technology creates motivation to focus and learn more." (Participant 7)

"The use of technology makes learning easier and more accessible; it helps sustain focus throughout the lesson." (Participant 6)

"Learners are more engaged when lessons include videos or interactive demonstrations." (Participant 9)

These excerpts show that ICT was considered one of the motivational factors in adult education. Technology was thought to help improve learners' concentration, attention, and involvement. Additionally, the results show that basic types of technology, such as videos or demonstrations, helped make lessons more interactive. Nevertheless, the results do not suggest that all learners had the same degree of benefit from ICT use. In other words, its effectiveness depended on learners' ability to access the required resources and learn to work with them throughout their studies.

4.6.2 Improved Conceptual Understanding Through Visualisation

From the results, the role of ICT is seen as valuable in enhancing visualisation to foster understanding. The use of ICT, such as videos, images, demonstrations, and projection screens, facilitated comprehension of topics that could not be understood solely through reading or verbal teaching. This occurred mainly in practice-based topics, where learners had to see an example of what was taught. Regarding Activity Theory, ICT appears to have served as a mediator in the interaction between the subject and the learning object, enabling the visualisation of the latter.

"Seeing a cashier working at the till made it easier to relate the theory to real workplace activities." (Participant 6)

"Using instructional videos and digital visuals, learners can clearly see how to operate a sewing machine." (Participant 9)

"When learning relies solely on textbooks, the content often becomes complicated… technology presents information visually, making it easier to understand." (Participant 6)

"Videos often provide clear and straightforward examples that enhance understanding." (Participant 1)

As shown in the citations above, the respondents associated ICT with the ability to explain things more clearly and achieve a good level of understanding. Even though learners felt ICT-

supported visual aids to be beneficial for making links between theoretical knowledge and practice, it is evident that educators believed videos and ICT-generated images to be beneficial for learning practices. According to the available information, ICT-supported visual aids have proven to be effective especially where learners had to watch a particular process or technique. Nonetheless, such views have been drawn from the personal opinion of the respondents.

4.6.3 Support for Diverse Learning Styles and Adult Learner Needs

Another reason why ICT was considered a facilitator in catering for the diversity existing among adult learners was because, from the results of our data, we saw diversity amongst the adult learners in terms of education experience, levels of confidence and literacy, and how they learn. ICT would therefore be a suitable approach because it would enable them to visualise, hear, repeat, and interact with the subject matter. The role of ICT is important, especially in ABET scenarios where learners have difficulty with written text or complex theories. In Activity Theory, ICT was used to mediate learning by creating different paths to the object of learning.

> *"Learners have different learning styles, and therefore it is beneficial to use a variety of teaching approaches, including the use of videos and images."* (Participant 10)

> *"Technology makes lessons more engaging, as learners can see and hear content in ways that go beyond books."* (Participant 3)

> *"Some learners comprehend better when they watch videos rather than only listening to an educator's explanation."* (Participant 4)

> *"ICT helps learners who struggle with understanding difficult concepts."* (Participant 1)

In terms of ICT being viewed as a means of widening accessibility by providing materials to cater to different learners, video clips and audio-visual aids were seen as effective because they did not depend solely on the written word. ICT played a crucial role for adult learners with very different literacy backgrounds. Nevertheless, an analysis of the data showed that ICT was not the total solution to learner diversity. Learners who lacked adequate ICT skills or lacked computer access would find it challenging to learn using ICT.

4.6.4 Perceived Improvement in Academic Performance and Assessment Outcomes

Participants identified their perceived improvements in confidence and performance through assessment as reasons for using ICT. Educators and learners felt that an ICT-based explanation was an easy way to grasp concepts and to come up with examples when answering assessment

questions. It should, however, be noted that this conclusion must be stated in terms of perceived improvement since there was no collection of pretest and post-test data on learners' performance from the same assessment. In this case, the collected data include participants' perceptions of improved performance and understanding using ICT.

> *"This also assists them during assessments because they perform better on topics that they easily understood."* (Participant 2)

> *"Access to technology can make a significant difference to my learning… which contributes to perceived academic improvement."* (Participant 6)

> *"ICT is very important. It assists to clarify things easily… linked to how we pass the learning area."* (Participant 10)

> *"Learners tend to retain information better when visual or interactive methods are used."* (Participant 9)

The above quotes indicate that participants found ICT to be associated with better understanding, improved recall, and increased confidence during the assessment process. Both learners and educators viewed ICT positively for its effectiveness in making learning materials more memorable. Additionally, it appears that increased confidence played a significant role in views on academic improvement. Nevertheless, there was no verification of whether their performance had changed as a result of using ICT in their assessments. It would thus be right to view the findings as a perception of academic improvement.

Analytically, Theme 3 indicates that participants valued ICT for engagement, visualisation and confidence, but these benefits were perceptions rather than measured causal effects on achievement. Chapter 5 therefore interprets pedagogical value cautiously and distinguishes perceived improvement from demonstrated learning outcomes.

4.7 ICT-Related Professional Development and Institutional Support

4.7.1 Availability of Basic and General ICT Training Opportunities

The information gathered from the interviewees indicated that professional development programmes for ICT skills were indeed offered to some adult educators; however, their descriptions of this training suggest that these programmes consisted mainly of basic, poorly organised training. Some of the training provided included digital literacy, end-user computing, online short courses, coding, web design, and blended learning workshops. All of these types

of training were designed to develop basic operational skills, particularly computer and software use. However, the data gathered make it clear that the training was not at all connected to the actual classroom teaching process, engaging learners, or integrating ICT into specific subjects. Under the Activity Theory approach, professional development was part of the support system in the CLC activity system.

> *"Basic computer training through an NGO and digital literacy training through DHET."* (Participant 2)

> *"I have attended End User Computing training… Word, Excel, and PowerPoint."* (Participant 3)

> *"Centre managers do get involved in DHET trainings on online learning and blended learning."* (Participant 1)

> *"We attend different training online such as coding, web design and technology skills for educators."* (Participant 2)

The quotes demonstrate that, while there were opportunities for training, they were mostly geared towards general ICT skills acquisition. Participants cited various institutions, ranging from NGOs to DHET-related programmes to online learning programmes. It is evident that professional development was taking place within the centres, although irregularly. However, it seems clear from the data that the training was scattered between various providers and did not seem to be part of any coordinated ICT preparation for educators at the centre level or within the context of ABET.

4.7.2 Uneven Access to Professional Development Across Educators

The study's results showed that not all educators had equal access to professional development in ICT. The participants explained that educators or educators responsible for ICT courses had greater access to ICT training than educators who taught other learning areas. The data suggest that some educators did not have equal access to available training, and some participants even suggested that non-ICT educators had not undergone any DHET training in ICT. In terms of Activity Theory, it becomes clear that there was a conflict in labour division, as different educators had different roles regarding ICT technology and training.

> *"Funding is usually limited to ICT educators, and opportunities are not extended to those of us teaching other subjects."* (Participant 9)

"Some educators have been involved in different trainings arranged by DHET… but not all." (Participant 1)

"There has been no formal training provided by DHET for educators teaching other subjects." (Participant 9)

"Very few educators are interested or trained enough to use technology in teaching." (Participant 1)

From the above, educators did not view professional development as equally available. While ICT training seemed to be associated with ICT learning areas, educators from other learning areas did not seem to have many chances for training. This is crucial to note since ICT integration was supposed to facilitate learning and teaching throughout, but training did not seem to be equally available to educators from all learning areas. From the above data, it can be observed that a lack of interest among educators and insufficient training are among the barriers at the centres. However, the two should not be viewed as being the same. It could be that some educators showed no interest, while others did not receive sufficient training.

4.7.3 Lack of Pedagogically Focused ICT Training

In summary, one major deficiency in professional development was the lack of pedagogically focused ICT training programmes. It is important to note that the participants were able to differentiate between ICT training focused on basic computer skills and training that helped educators design lessons using ICT to encourage learner engagement and effectively manage learning platforms. In essence, the findings indicate that while educators may have had some operational ICT skills, they were not sufficiently applied in ICT training programmes. In Activity Theory terms, this represents the conflict between the tools and the activity's object. While ICT tools could be accessed, they might not necessarily help achieve the activity's objective.

"There has been no formal training specifically focused on how an educator can effectively design a lesson to optimise learner engagement and learning outcomes." (Participant 2)

"I would like to receive training related to teaching with technology, as well as training on learner management platforms." (Participant 3)

"There has been no formal training provided by DHET for educators teaching other subjects, such as sewing." (Participant 9)

"Training usually focuses on basic computer skills, not on how to use ICT in teaching." (Participant 1)

The above excerpts illustrate that the trainees required training that went beyond basic computer literacy. Educators stated the necessity of ICT training in lesson preparation, learner engagement, learning management systems, and the application of ICT in subject-related contexts. It is clear from the data above that other subject, including those such as sewing, which were not ICT-related, were sometimes overlooked during ICT-related training. This fact is important since the data above show that ICT can be quite beneficial in practice, especially for visual-based subjects. However, educators in such fields rarely receive ICT training relevant to their work. Therefore, the data show that the gap in educators' professional development concerns the type of training they receive.

4.7.4 Need for Ongoing, Structured and Mandated Professional Support

Professional development was also seen as essential to continue. It is clear from the data analysis that ICT integration was voluntary for many participants, driven by personal educator motivation rather than required across every area of learning. In relation to Activity Theory, the idea that ICT integration lacks in terms of rule and community aspects within the process is seen as playing a critical role. The lack of a compulsory ICT requirement and the need for training and assistance from management indicate that it was not seen as something that would occur after a single training session.

"There is no compulsory requirement for educators to make use of technology in their teaching." (Participant 1)

"Mandating ICT integration in CET teaching and learning would improve consistency." (Participant 2)

"Workshops on different topics to unpack different ways of teaching with technology are needed." (Participant 1)

"Campus administration ought to promote the idea of working together in the use of ICT." (Participant 4)

From the quotes, the participants required clear guidelines, a structured workshop format, and increased institutional backing for ICT integration. From the above data, it is also evident that some participants considered the idea of consistency in the use of technology in their learning as something that should have been mandated by the institution. However, this did not imply

that the participants wanted any form of compulsory use of technology. Instead, they emphasised the need for proper guidance, support and collective responsibility. In addition, the mention of campus administration in the quotes indicates that ICT integration was considered an institutional issue rather than just educators' alone.

Analytically, Theme 4 shows that general digital-skills training did not automatically translate into pedagogically focused classroom integration. This finding is taken into Chapter 5 as evidence of a pedagogical-digital divide shaped by the interaction of competence, institutional support and access conditions.

4.8 Chapter Summary

The results presented above are based on interviews with educators, learners, and managers of the two CLCs. There are four major themes emerging from the above thematic analysis: the availability and accessibility of ICT, the frequency and scope of ICT integration, the pedagogical significance of ICT, and, finally, ICT professional development and support by institutions. The results show that, though ICT were available, its accessibility was uneven due to factors such as facility sharing, limitations, and poor infrastructure. ICT has been used for lesson preparations, administrative tasks, and practical subjects. But the integration of ICT in classrooms was minimal and uneven. The participants' responses indicated that ICT could help engage learners, visualise concepts, deepen understanding, and increase confidence. It is also clear from the above that the ICT training has been very basic and uneven.

CHAPTER 5: DISCUSSION OF FINDINGS

5.1 Introduction

The purpose of this chapter is to undertake an interpretation and critical analysis of the empirical findings, considering the objectives and research questions formulated for this study. Contrary to Chapter Four, whose primary focus was detailing the collected information, in this chapter, more than just describing the collected data, a process of offering its interpretive meaning and explaining it is undertaken. Thus, the analysis critically examines the experiences of adult educators, learners, and centre managers within the broader structural, institutional, and pedagogical context of the introduction of ICT in CLCs. Through this interpretive approach, we not only describe participants' experiences but also discuss them in the context of educational disparities in post-apartheid South Africa and the role of adult education in national ICT policies.

5.1.1 Theme-based Discussion Approach

This chapter follows a theme-based approach to discuss each of the four research questions. The discussion is based on theories related to the research topic presented in earlier chapters. Each discussion section is based on one theme from Chapter 4. The analysis is made with system-level concepts such as infrastructure, policy alignment, professional development, and educator empowerment in mind, as it is realised that the implementation of ICT in education and instruction does not depend solely on individuals. The chapter is arranged in a sequential way, starting from the basics, including access and use of ICT, then moving forward to their importance in education, professional development of educators, and finally incorporating the theoretical dimensions of all these issues.

5.2 Discussion of Findings in Relation to Research Question 1: What types of ICT tools are currently available and accessible to adult educators in CLCs?

5.2.1 Availability of ICT Infrastructure in CLCs: Presence Without Sufficiency

Based on the presented statistics, it is apparent that, despite the presence of elementary ICT facilities at CLCs (desktop computers, printers, projectors, laboratory instruments), these facilities do not seem to provide a conducive environment for effective teaching and learning. According to Makgati and Awolusi (2020), even though the availability of ICT equipment in learning institutions in South Africa is present, one cannot claim that the impact brought about by the availability of these facilities is a positive one without proper utilisation of these facilities

since the availability alone does not mean anything at all. As noted by Aruleba and Jere (2022), underservicing with regards to the provision of facilities for education was also evident in the rural and semi-rural areas.

Furthermore, the difference between the institutional capability and externally funded ICT projects makes things even harder. As reported by Adelabu et al. (2022), although the external funding is employed to supply innovations, they might not be sustainable since they would be improperly integrated and maintained. Likewise, according to Shava (2022), ICT, which are a product of external funding, cannot be linked to the constant learning process because they exist outside the framework of the class timetable. Mnisi, Mtshali, and Makgato (2024) emphasise that in case the infrastructure is not included in the major agenda of the institution, its importance will be greatly diminished. In the CLC case, ICT resources supplied by external donors can look very much different from institutional ones.

5.2.2 Access Inequalities Within CLCs

From the findings of the study, ICT is unevenly distributed among many fields of education, where fields which emphasise ICT give greater access to ICT compared to other fields. As highlighted by Munje and Jita (2020), such uneven distribution of ICT equipment affects the quality of teaching and engagement of learners in lessons that emphasise ICT compared to those that do not and are taught by ICT experts. As noted by Ramnarain and Ndlovu (2023), the use of ICT in education has shown higher effectiveness in literacy subjects. Thus, educators working in other disciplines face problems with their implementation. The shortage of ICT facilities negatively affects the development of cross-subject education and the implementation of new teaching methods (Patricia, Isaac, and Manto, 2023). Instructors of non-ICT subjects reported limited access to computer rooms and technological resources, which led them to use conventional teaching techniques. Such an allocation of resources limits ICT to certain functions, thus defining technology as an accessory device rather than a comprehensive tool for enhancing the whole curriculum (Shava, 2022).

Moreover, using Amartya Sen's Capability Approach enhances understanding of access. According to Sen, access to resources must go beyond mere ownership for an individual to perform beneficial functions, including full participation in digital society (Abel et al., 2022). In CLCs, the use of ICT is curtailed, making it difficult for educators to take advantage of ICT in all the learning processes. Hence, learners cannot participate actively in their education as they do not have ICT skills and access to ICT. It should be noted that this uneven balance is

caused by inequalities within society, maintained through the system of institutional control and resource imbalances (Akintolu and Letseka, 2021).

5.2.3 Shared Resources as a Structural Constraint

Resource sharing in CLCs is essential given the shortage of resources; however, it remains one of the structural limitations of ICT integration. In this connection, as pointed out by Bell et al. (2022), control mechanisms in institutions include measures that are intended for the protection of resources rather than the provision of pedagogic flexibility. Measures like booking of resources and resource access strategies, although very significant for the fair allocation of resources among users, restrict the impromptu utilisation of ICT in teaching as educators are not able to alter lesson delivery methods when required. Additionally, as pointed out by Aruleba and Jere (2022), the policies of resource utilisation should stimulate innovation and creativity among educators; on the contrary, resource policies generally prevent educators from making creative use of ICT. As suggested by Abel et al. (2022), resource sharing policies normally act as obstacles to creativity among educators. The participants indicated that, due to reliance on booking, educators could not make changes to the lesson plan to incorporate ICT.

Moreover, whereas resource sharing could be seen as a good way to ensure the effective use of available resources, it is essential that the process of sharing such resources be evaluated in terms of making the best use of their educational potential. According to Ngcapu, Simelane-Mnisi, and Mji (2022), pedagogical resource sharing, rather than administrative sharing, tends to empower educators by allowing them to employ flexible teaching approaches. It seems clear, however, that CLCs' resources are shared administratively and, thus, they are subject to rigid timetables for availability. The efficiency of the ICT available at the centres could thus be questioned, since educators only have access to them at certain times. Hashemi et al. (2022) state that such processes often prioritise efficiency rather than flexibility. However, what should be emphasised is that the problem does not consist in the very process of sharing the resource but in the way it is conducted. The point is that, according to Shava (2022), without proper actions that would guarantee accountability and focus on the pedagogy, the integration of ICT in education practice by means of CLCs created within the framework of the ABET initiative, would be insufficiently consistent. Indeed, in the course of conducting the research, the participating educators had to give up their lesson planning and resort to ICT owing to a lack of resources and time. It is important to state that according to Akintolu et al. (2023), the absence of institutional support, flexibility, and a strategic approach to incorporating ICT tools would render any efforts to implement such innovations ineffective. Additionally, it is worth

mentioning that according to Daniels (2020), there is no comprehensive framework in institutions to guide ICT integration within the adult education domain, hence causing inconsistency.

5.2.4 Infrastructure Limitations and Their Pedagogical Consequences

The findings indicate that a lack of adequate ICT tools and the Internet is a challenge to teaching and learning processes at CLCs. As highlighted by Munje and Jita (2020), unstable ICT resources in the classroom and interactions are a challenge. According to Aruleba and Jere (2022), the connectivity challenge continues to affect learning in rural areas. According to Kilag et al. (2023), with the availability of ICT infrastructure, the staff member could do nothing other than limiting the use of ICT. According to observations made in those circumstances, both the learners and the educators used old ICT equipment like computers because there were no Internet services. The lack of ICT infrastructure, therefore, constrained the use of ICT and the involvement of the learners in research work.

A delay becomes a bottleneck in organisations. According to Yalley (2022), a delay in the maintenance of ICT infrastructure will make people lose confidence in each other, making them plan wrongly. It was also observed by Mnisi et al. (2024) that any challenge resulting from ICT creates a precedent for the use of ICT and will make organisations rely on traditional approaches. Similarly, Shava (2022) explains that educators will avoid using ICT during their classes. In the present study, educators had to rely on textbooks and oral delivery of lectures due to infrastructure issues related to ICT, although these were valuable in the process.

5.3 Discussion of Findings in Relation to Research Question 2: How frequently, in what ways, and to what extent do adult educators integrate ICT into teaching and learning practices?

5.3.1 Predominance of Administrative and Preparatory ICT Use

From the results, the use of ICT was found to be focused more on the preparation and administration of the teaching process as opposed to the process itself. This was evident from how adult educators utilised ICT when developing lesson plans, typing letters, printing educational materials, producing handouts through photostat, and preparing examination papers. As noted by Abel et al., educators can appreciate ICT regardless of their utilisation for functionality purposes. From an Activity Theory point of view, ICT tools were included in the activity system but were not fully integrated with the object, which is the transformation of education and learning processes. The main contradiction in this case is that of tools and

objects, in which ICT was primarily used as a mediator to lighten the load of adult educators, rather than to improve learner-centred pedagogical practices.

A trend also indicates another issue associated with ICT integration in South African schools: access to technology does not necessarily translate into actual pedagogical practice. According to Makgati and Awolusi (2020), one of the constraints affecting ICT use in South African learning environments is the lack of proper pedagogical plans. In the current research, the use of ICT for administrative purposes could not be considered unimportant, as they enabled the process of efficiency and the preparation of materials for classes. However, this application did not influence the learners much since it did not form part of the instructional process. According to Yalley (2022), technology utilisation within educational institutions might still be restricted to administrative activities because of the lack of an implementation framework. From this observation, it is safe to conclude that CLCs require guidelines for ICT integration in pedagogy.

5.3.2 Limited and Inconsistent Classroom-Level Integration

The above-discussed challenges were not the only thing, but what also stood out was the presence of a poor and individualised process of ICT integration in classrooms. The ICT was being used by some educators through video clips, projectors, and computer labs, whereas other educators would integrate ICT before teaching started or did not integrate ICT into their lessons at all. It is important to note that the above-discussed points coincide with the results obtained by Kafu-Quvane (2021). Using Activity theory, one of the contradictions that stood out was tool vs rules, because although ICT tools were present in different forms, no institutional rules made their usage in the classroom compulsory. As a result, ICT integration depended on the individual rather than the institution, leading to innovation and tradition coexisting within the same institution.

Inconsistent results are also indicative of the conflict between the community and the division of labour. In an effective ICT integration strategy, centre managers, educators, other personnel, and learners share the task of maintaining ICT-supported teaching. Yet, the analysis of the findings shows that some individuals took responsibility for ICT implementation, mostly educators with greater self-confidence and private access to ICT. According to Mnisi et al., there is always going to be a mismatch in ICT integration where the technology infrastructure, educators' competencies, and organisational considerations do not match. Similarly, according to Ngcapu et al., ICT integration must be done with regard to organisational planning, and not

with only the interest of the educators in mind. Therefore, the lack of ICT integration was not due to educators being unwilling, but due to organisational shortcomings.

5.3.3 Subject-Specific Patterns of ICT Integration

This means that the use of ICT seems to be more tangible in physical learning fields compared to conceptual learning fields. The learners have been able to debate about the application of ICT like videos, project presentations, and screen presentations in the learning fields, such as sewing, wholesaling, retailing, entrepreneurship, and ICT. This is because, according to Adelabu et al., (2022), the use of technology-enhanced environments might be useful in fields that involve visualisation and demonstration. According to Activity Theory, ICT tools were more aligned with the objective of learning when they involved the visible and procedural aspects of learning processes. It was for this reason that the educators integrated ICT tools into their learning process once the relationship between the tools and the objectives became apparent. Hence, apart from being an access problem, it was also a pedagogical problem.

Subject-specific use of ICT may also be understood through the concept of the Diffusion of Innovations Theory. The reason for the relatively higher advantages of ICT in practical subjects is that both educators and learners noticed that videos, demonstrations, and project examples helped enhance explanation skills. According to Rogers (2003), an innovation is more likely to be adopted if people feel it provides useful results, is compatible, and can be easily observed. In this case, the usefulness of ICT was observed in practical learning subjects since learners were able to observe procedures involved in content learning and relate them to daily activities. ICT adoption in literacy and non-ICT subjects was poor due to a lack of educational training on ICT use in these subject areas.

5.3.4 Reliance on Personal Devices as an Informal Coping Strategy

Furthermore, there was evidence of educators' personal use of gadgets such as laptops, mobile phones, and internet modems to counteract the insufficient provision of ICT facilities by institutions. Personal use in such instances was a product of the commitment of the educators. This was indicative of delegation of authority on the part of the educational institutions to the educators. As stated by Aruleba and Jere (2022), this is a very common phenomenon in poorer environments owing to the inadequate supply of these resources officially. From the perspective of Activity Theory, this indicates a contradiction between community and division of labour. While the community was hoping for ICT-based teaching, it was the individuals who had to bear the financial and practical costs of access.

Moreover, it is possible to explain the employment of personal gadgets based on what is called the 'hidden privatisation' of costs related to Information and Communication Technology (ICT). As pointed out by Shava (2022), an educator can pursue his/her activities on an individual basis when there is no support from the institution. In this instance, the individual effort facilitated the availability of materials, planning of lessons and displaying competence, but using ICT. According to Munje and Jita (2020), unequal access to ICT equipment perpetuates inequality in teaching and learning practices. Such a finding supports the mentioned statement, as inequality among educators can occur those with personal devices may benefit more from integrating ICT than those without access to ICT facilities.

5.4 Discussion of Findings in Relation to Research Question 3: What are adult educators' perceptions of the pedagogical value and effectiveness of ICT integration?

5.4.1 ICT as a Catalyst for Learner Engagement and Motivation

Respondents regarded ICT as useful for increasing learners' engagement and motivation in ABET classes. Learners and educators found ICT-enhanced learning more engaging than lessons delivered solely with books and verbal instruction. This finding is consistent with Daniels' (2020) claim that adult education should provide learning experiences that consider the lived realities of marginalised learners. The findings concur with Akintolu and Letseka's (2021) assertion that adult learning requires methods that link knowledge to its relevance and to learners' preparedness to learn. Using Activity Theory, the tools provided by ICT were used as mediators that modified the subject-object relationship in terms of engagement. This finding applied especially when ICT was functional and applicable to the activity.

However, the notion of engagement must be cautiously examined. While participants regarded ICT as motivational, the study did not use attendance numbers as indicators of engagement. It may well be that the motivation stemmed from the introduction of technology, which served as a new instrument for teaching and learning. As noted by Nchabeleng (2024), ICT, when implemented in the community education environment, is warmly welcomed by both the learners and educators; however, ICT proves to be unproductive in instances where there exist obstacles to the implementation of ICT. The problem, therefore, does not seem to lie in the motivation aspect of ICT among the learners, but rather on holistic institutional implementation.

5.4.2 Visualisation and Conceptual Understanding in Adult Learning

The application of ICT by the learners was observed to have played a crucial role in the visualisation and conceptualisation process. This became possible because of the application of videos, pictures, demonstration, and case study as a tool for enabling them to understand difficult concepts. This finding is consistent with the claims made by Patricia, Isaac, and Manto (2023) that technology is useful when the concepts under consideration involve creative or practical application. In this case, Ditlhale and van den Berg's (2024) work on how mobile and digital learning can open new learning avenues for adults proves relevant. From the Activity Theory perspective, the tools used were mediators since they made knowledge and processes easier to visualise. This proved especially useful in skill-oriented areas, where learners had to visualise the process before executing.

The above findings represent progress in the study area, as they show that visualisation is an important aspect, both technically and pedagogically, as it serves as a tool connecting the educator and the ABET learners. The adult education environment is marked by disparities among various levels of literacy skills and experiences of adult learners enrolled in adult learning centres. As mentioned by Belete et al. (2022), adult learning centres found in the community are considered parts of learner-centred and community-based adult education. ICT visualisation technique was selected because it provided a sure way of ensuring that learning was practical.

5.4.3 ICT and the Accommodation of Diverse Adult Learner Needs

According to the participants, ICT was useful in meeting the needs of adult learners from diverse backgrounds. The adult learners studying in ABET settings differ in terms of age, level of education, literacy level, and familiarity with technology. From a study conducted by Land (2021), it emerges that adult education educators teaching in community colleges are faced with complex circumstances that need to be tackled through new approaches. The present study reveals that ICT was helpful in assisting participants in tackling diverse learners using videos, images, audiovisuals, and reviewing content. This finding corroborates the assertions made by Sasere and Makhasane (2023).

Nonetheless, it needs to be noted that the findings indicate that ICT does not provide equal accessibility. Learners with low-level digital skills or poor access and confidence can regard technology as something difficult. Digital literacy is required for one to participate in technologically rich environments as argued by Masenya (2021). This statement: "ICT is

valuable when learners can access it, but somewhat exclusionary for those with digital illiteracy", is supported by current research. Such opposition can be considered a contradiction in Activity Theory, in which the instrument does not necessarily promote its users' activity due to obstacles.

5.4.4 Perceived Impact on Academic Performance and Assessment Outcomes

As shown in the findings, the respondents perceived ICT as one of the factors influencing increased confidence and readiness to assess content knowledge. According to respondents' opinions, ICT-enabled explanations led to better retention of knowledge and its application during the assessment procedure. The findings obtained are consistent with the concept of adult learning theory proposed by Akintolu and Letseka (2021). According to the above theory, adults learn more efficiently if knowledge is combined with understanding. The findings obtained from the present study can be related to the views of Molema (2023) concerning the use of technology for promoting learning among adults. However, it is important to note that grades have not been included in the present study.

Another way needs to be adopted because there was neither a pretest nor a post-test employed here. In addition, the scores of ICT-based and ICT-unrelated lesson teachings were never compared to each other. As mentioned by Nchabeleng (2024), the issue of digitalisation in community education needs to have more research on the impact of ICT on learners and educators. The study discussed above provides only perceptual evidence of ICT's impact and does not establish causation of better academic results. Based on Activity Theory, the academic outcome of a lesson should be the desired result of the ICT activity. Still, there is some mediation from access, competence, and readiness that needs further investigation.

5.5 Discussion of Findings in Relation to Research Question 4: What ICT-related professional development opportunities are available to adult educators in ABET?

5.5.1 Nature and Scope of Existing ICT Training Opportunities

The findings show that ICT training for the professional development of educators at ABET centres tends to emphasise ICT skills and digital literacy development. According to Akintolu and Letseka (2021), the type of ICT training provided to the educators focuses only on the attainment of practical ICT skills. According to Holler, Brändle, and Zinn (2023), the aim of such training is to equip the educators with computer skills so that they can be able to utilise ICT in adult learning situations. In their critique of the Denhere and Moloi (2021) program, it is clear that the issue is that of digital inclusion rather than ICT skills for digital inclusion as

required by national policy. However, according to educators trained in ICT, the emphasis of this programme is on basic ICT skills such as software and internet technologies.

Professional development can be achieved through cooperation with NGOs, the DHET courses, and online seminars. As explained by ETDP SETA (2021), the state failed to handle the problem connected to adult education well and it may be important to collaborate with some external organisations in order to tackle the problem. Akintolu et al. (2022) note the growing popularity of distance learning and informal courses for training amid the pandemic caused by coronavirus. Even though work within a digital environment was easier, the authors point out that the development process itself was inconsistent and random. Digital competencies have recently gained considerable importance in the field of post-school education and training. In fact, according to DHET (2013), the issue is actively discussed nowadays. Still, it should be noted that professional development among educators of CLCs is inconsistent, which means that it will not improve efficiency of teaching since they do not have any ICT skills.

Also, as per some scholars, the contextualisation of the training models for ICT training would be needed to ensure that there is an effective pedagogy for adult learners. As indicated by Akintolu et al., despite the training models failing to consider the context associated with ABET, they can be able to deal with general issues. Similarly, according to Nchabeleng (2024), the training offered by learning institutions as well as TVET colleges may not necessarily have any relation to adult education. The same scholar argues that in the process of ICT training for adults, the elements of andragogy need to be considered alongside technical training.

5.5.2 Unequal Access to Professional Development

Based on the results presented in this study, it is clear that the problem concerns substantial inequality in ICT professional development for adult educators within the ABET framework. It may be caused by the imbalance in the allocation of educational resources among adult educators working in the ABET sector. From the above statement provided by Holler et al. (2023), one can notice that it is likely that there will be a very uneven distribution of ICT training for educators since some educators, who are ICT educators, receive more training compared to other educators. Further, from the above statement provided by Akintolu et al. (2022), although ICT educators have many opportunities for undertaking training, the other educators have virtually no opportunity for undertaking such training. In addition, from the above statement provided by ETDP SETA (2021), because of financial constraints, educator training will be selective.

An analysis of the policy context is necessary to shed light on the mechanisms through which such inequalities can arise. The process of making decisions about resource distribution occurs within a broader policy context that highly prioritises the education of ICT specialists. Such criteria are vague and fail to address the needs of different types of educators. According to Daniels (2020), elderly educators, as well as those who lack experience with ICT, are denied training. In addition, according to Denhere and Moloi (2021), the focus on training young educators who have technical knowledge does more harm than good as the elderly can significantly benefit from such training.

Besides the individual consequences of inequality in the provision of ICT training, it is necessary to mention some organisational implications that should be considered. For instance, as per Nchabeleng (2024), unequal distribution of resources can cause fragmented learning processes, as some educators are more apt at teaching learners how to use ICT efficiently compared to other educators. Such negative implications of inequality in resource distribution could have adverse impacts on organisational efficiency as well as lower employees' motivation because there are no ICT-based programmes. In addition, such issues may be viewed as the separation of ABET educators mentioned by Akintolu et al. (2022). Based on the research findings, it can be suggested that dissatisfaction among ABET educators is associated with the lack of ICT-based training.

5.5.3 Absence of Pedagogically Focused ICT Training

From the analysis conducted above, it is clear that the central issue regarding ICT learning among educators in South Africa relates to its pedagogical nature. According to Akintolu and Letseka (2021), emphasis should be put on the relationship between ICT skills and pedagogy. As stated by Holler et al. (2023), although educators can demonstrate certain technical knowledge and skills related to the use of ICT tools, it turns out that it is difficult for them to find relevant sources needed to plan lessons based on ICT. Lack of combined knowledge and skills results in improper application of ICT in teaching activities. At the same time, Ditlhale and van den Berg (2024) suggest that introduction of technology into the teaching process will result in ineffective learning because educators lack proper pedagogical skills to use technology properly.

Apart from this being a wrong way to do it, it is also symptomatic of a trend in South Africa where educator education concentrates more on the acquisition of subject matter knowledge rather than pedagogical knowledge. According to Nchabeleng (2024), a lack of pedagogical

integration in educator's education shows that the technicist paradigm prevails in educational transformations. The technicist paradigm refers to technical competency in skills alone without consideration for the pedagogical aspect. The idea of ICT-based educational innovation, as criticised by Selwyn (2017), aligns with the same approach. The approach implies no awareness of the need to innovate in education pedagogy when integrating ICT. This will not happen until educators gain sufficient knowledge of technology from a pedagogical perspective. As seen in the current study, educators who had developed digital literacy skills were reluctant to employ ICT in innovative ways due to a lack of pedagogical skills.

In addition, the lack of ICT training among adult educators contributes to the challenges encountered in adult education in various ways. The omission of ICT in pedagogy means that educators and learners alike are deprived of the power that ICT can wield in revolutionising their teaching approaches. According to Akintolu et al. (2022), the successful integration of ICT in the teaching process requires both technical and pedagogical training. The educators in this study indicated that appropriate training in ICT, specifically geared towards adult educators, was lacking. It means the process of technology adoption is less than efficient due to the absence of pedagogical training, which reduces technology to a mechanical process.

5.5.4 Institutional Gaps in Structured and Mandated Support

The results of this study identify and elaborate on some of the institutional and systemic inadequacies that relate to the provision of structured and enforced ICT-related `professionally supportive' services. DHET (2013) notes that, while policy documents orbit around digital literacy and its related components, they remain somewhat sparse in providing guidance on digital literacy within the context of adult basic education and training (ABET). According to Akintolu et al., there does not seem to be any guidelines or rules guiding the running of CLCs. Additionally, Nchabeleng states that the lack of an ICT policy for the CET sector leads to a policy vacuum and uncertainty in the sector. The respondents interviewed in this research pointed out that there are no expectations or guidelines concerning the use of ICT. Therefore, in the absence of any such policy, professional development becomes fragmented and left at personal discretion.

Moreover, in the absence of accountability mechanisms, what little potential there may have been for professional development becomes completely void. According to Holler et al., the essence of training without participation and application means that it is just a waste of time and of development itself. For professional development to remain, a further set of principles

must be established and embedded within the structures of an organisation, along with concepts of accountability and supportive mechanisms. In the CLCs evaluated in the study, adult educators reported that ICT training was voluntary and that there was no systematic assessment of it. This lack of accountability results in the training being of limited use in the classroom.

Empirical evidence substantiates professional development as an institutional rather than a personal responsibility. As stated by DHET (2013), ‘digital transformation is a phenomenon that requires sustainable and coordinated institutional costs’. As mentioned by Akintolu et al. (2022), it is not recommended to have reliance on the resilience abilities of the educator without any form of structures. The transformative abilities of adult education rely on the creation of supportive institutional structures, according to Daniels (2020). It should be noted that, in the present case, the use of ICT was left to the discretion of the educator, indicating that the advocacy for its adoption in an institution is imperative.

5.6 Cross-Cutting Discussion: Systemic and Institutional Dynamics of ICT Integration

5.6.1 ICT Integration as a Systemic Rather Than Technical Challenge

The analysis results provide evidence that the integration of ICT into the CLCs should be regarded as a systemic issue rather than a problem of technology alone. According to Akintolu et al. (2022), four major constructs should be considered when analysing the technology usage process: infrastructure, institutional policy, educator capability, and organisational culture. Although one possesses all the necessary infrastructure, there may still be a problem with the efficiency of technology use due to educators' lack of relevant skills and expectations (Nchabeleng, 2024). Having all the tools in hand, people still cannot integrate them properly because of the contradictions existing within the system. According to Nchabeleng (2024), the problem under consideration is not due to system inertia. There is no question that a supportive mechanism should be introduced to ensure effective integration.

Theoretically, incorporating Activity Theory can yield greater insight into these systemic issues. In Engeström’s (2001) elaborated theory of activity, the relationship among the subject (the educators), the object (ICT incorporation), and the means (the ICT tools) becomes significant. There are contradictions in the policies regulating access to ICT tools within the institution, as well as in the division of labour. This makes it difficult for educators to take up the challenge and use the technological tools effectively. This is not simply a technical problem but an example of systemic dysfunction, which must be solved by bringing policies, infrastructure, and the process of educating educators into harmony with each other.

In addition, this tension is further complicated by the constraints on the educator's agency. As Daniels (2020) observed, the constraints in the organisational structure define the potential of education. Additionally, as per Akintolu and Letseka (2021), the mere emphasis on improving educators' technical competence fails to enhance educators' agency, which is essential for facilitating transformations in the learning process. Moreover, as stated by the Department of Higher Education and Training (DHET) (2023), a lack of any form of structure in the post-schooling sector poses challenges to the digital transformation process. Concerning the study at hand, the unstructured nature of ICT adoption in ABET originated from ineffective policy coordination, insufficient resources, and a lack of professional training.

5.6.2 Adult Education as a Marginalised Space in National ICT Agendas

These findings reveal that although various efforts have promoted the importance of ICT, the supply of adult basic education and training programmes in the country continues to operate on the margins of any strategy to implement South Africa's ICT initiatives. Akintolu et al. (2022) note that adult education remains marginalised within the country's overall educational policies. For instance, although DCDT's (2020) strategic plans have been developed, they focus only on primary schools, TVET colleges, and higher education institutions. The neglect of ABET centres, a characteristic of sectoral funding strategies, according to ETDP SETA (2021), is another finding of this research. Thus, in addition to revealing poor infrastructure as one of the problems in South Africa, the lack of access to ICT resources has made it impossible to discuss issues of digital inclusion.

These dynamics become even more pronounced when considering the roles of lifelong learning and social justice perspectives in relation to ABET. According to Statistics South Africa (2023), many adults in South Africa with low educational qualifications have been denied access to the digital world. According to Daniels (2020), adult education is a transformative realm; however, it can be effective only when it embodies the principles of social justice. While DHET (2013) recognises that lifelong learning is a national priority, the policy's aim is undermined by the lack of effort to address the digital divide within ABET. The consequence of this situation is that the needs of adult learners who could benefit from ICT have not been met. As a result, the country's neglect of ABET in ICT leads to an unjust situation.

5.7 Theoretical Interpretation of Findings

5.7.1 ICT Integration Through the Lens of Activity Theory

The use of Activity Theory to make sense of ICT Integration at CLCs is appropriate, as the theory considers teaching and learning as a socially organised activity system rather than an educator's personal practice. In this case, the subjects were adult educators, learners, and centre management, while the tools included computers, projectors, printers, internet connectivity, mobile phones, and digital learning materials. Teaching and learning improvement using ICT was the object of the activity system. Engeström (2001) observes that the interactions among the elements of subjects, tools, rules, community, and division of labour define activity systems. This is relevant because the study results indicate that ICT Integration was determined by access rules, educator competency, infrastructure, professional development, and centre-based supports.

There were certain inconsistencies within the activity system regarding the use of ICT. Firstly, the inconsistency was that while providing the ICT tools, they were used not for educational purposes but only for administrative and preparatory purposes. This might be explained, as suggested by Abel et al. (2022), by the fact that educators like using ICT but lack pedagogical experience with them. In addition, there were certain inconsistencies regarding tools and rules, since, under the regulatory conditions for accessing ICT, they could be successfully employed. In accordance with Nchabeleng (2024), certain institutional barriers might hinder the process of digitalisation within the South African community education and training institutions.

The other contradiction that emerged concerned the community and the division of labour. While it was imperative that centre managers, educators, learners, support systems, and sometimes even external parties come together to engage in the process of ICT implementation, educators alone were responsible for carrying out this duty. According to Engeström (2001), contradictions are important because they highlight the need to introduce change into the activity system in that field. In the present case, the problem with implementing any change was that the individuals involved could not share the burden.

5.7.2 Diffusion of Innovation and Educator Adoption Patterns

Innovation Diffusion Theory accounts for the reasons behind the different rates at which adult educators embraced ICT in their centres, areas of learning, and lessons. According to Rogers (2003), diffusion depends on the following five features: relative advantage, compatibility, complexity, trialability, and observability. The findings from this study indicate that the relative

advantage of ICT was evident, as educators saw it as an effective tool for visually demonstrating concepts, engaging learners, and preparing lessons. As indicated by Abel, Tondeur and Sang (2022), this perception affects the extent to which ICT becomes part of classroom instruction. On the other hand, the perceived advantage of ICT was context-specific, as educators did not embrace it due to technical or logistical challenges.

Moreover, compatibility also differed according to the ABET context. ICT was more compatible with practical subjects, as the use of videos, demonstrations, and example projections aligned with the requirements of such subjects. According to Adelabu, Alex, Ngwabe, Tatira and Boateng (2022), the use of technology-based learning spaces is more beneficial when visualisation is required. On the other hand, the compatibility between ICT and non-ICT subjects was difficult, as the educators lacked models to help them use technology in their teaching. The complexity factor in ABET was also significant, as educators had to know how to use computers beyond their basic functionality to achieve effective ICT use. Sasere and Makhasane (2023) emphasise the application of adult learning principles to address the ICT skills gap among South African educators.

Trials and observability were also limited in ICT at the chosen learning institutions. It was not possible to conduct trials on ICT usage due to the limited availability of computer facilities, internet, and projectors, which were subject to reservation systems. As Rogers (2003) points out, innovation spreads much faster when the innovation can be tried. Regarding the chosen case study, the implementation of ICT was very effective in some subjects, but not all educators or subjects achieved success. The same limitation is encountered in the digital transformation of education in communities when the system is poorly coordinated within an institution. According to the Diffusion of Innovation Theory, the adoption of ICT among educators depended on whether it was compatible with the ABET context.

5.7.3 Study Unique Contribution

This study makes several original contributions to the fields of adult education, educational technology, and South African education policy. Empirically, it provides original qualitative evidence on ICT integration from the perspectives of adult educators, adult learners, and centre managers within two CLCs, a stakeholder triad rarely examined together in the adult education literature. From this empirical foundation, the study advances three interconnected conceptual constructs. Firstly, it introduces the concept of conditional presence to describe situations where ICT infrastructure physically exists but is rendered pedagogically ineffective by

institutional rules, unequal distribution across learning areas, and infrastructure failures. This challenges binary measures of ICT access and demonstrates that, infrastructural presence is not synonymous with pedagogical availability. Secondly, the study identifies and theorises hidden privatisation in ABET ICT integration, whereby the costs of ICT infrastructure, maintenance, and connectivity are informally transferred from institutions to individual educators through reliance on personal devices. This reframes what might appear as 'educator resilience' as 'evidence of systemic under-resourcing'. Thirdly, the study extends digital divide theory by conceptualising a pedagogical-digital divide, the gap between educators' basic ICT operational skills and their ability to integrate ICT meaningfully into teaching practices. This divide persists even when infrastructure is present, and educators are digitally literate; suggesting that professional development must shift from technical training to pedagogical formation. Theoretically, the study provides an empirical application of Engeström's Activity Theory to the South African ABET context, identifying specific systemic contradictions between ICT tools, institutional rules, and the division of labour that collectively explain why ICT infrastructure presence does not translate into pedagogical integration. Analytically**,** the study contributes a stakeholder-specific analysis of ICT integration barriers, demonstrating that educators, learners, and centre managers experience qualitatively different constraints, a finding that challenges one-size-fits-all policy interventions and supports differentiated strategies for institutional, pedagogical, and learner-facing challenges. Collectively, these contributions offer both a diagnostic framework for understanding ICT integration failures in under-resourced adult education contexts and a prescriptive orientation for targeted intervention design.

5.7.4 Revised Conceptual Model of ICT Integration in CLCs

5.7.4.1 Overview of the Model

Figure 1 presents the revised conceptual model of ICT integration in CLCs. The model synthesises the study's empirical findings into four related dimensions: infrastructure, access patterns, pedagogical practices, and learning outcomes. Infrastructure refers to the availability of ICT equipment, resource constraints, and the uneven distribution of ICT resources across the two centres. Access patterns refer to programme-specific access, shared-use arrangements, control systems, and unequal access by subject area. Pedagogical practices refer to how ICT is used in teaching, including administrative use, educator initiative, confidence and limited classroom integration. Learning outcomes refer to the perceived benefits reported by participants; including engagement, motivation, improved conceptual understanding,

confidence and academic performance. This layered structure is consistent with the view that ICT integration cannot be reduced to the mere presence of devices, since meaningful use depends on institutional access, educator competence and pedagogical purpose (Abel, Tondeur and Sang, 2022). It also reflects the specific role of CLCs as adult learning spaces operating within social, institutional and resource constraints (Belete et al., 2022). Within the South African context, the model responds to evidence that digital transformation is often constrained by infrastructure inequality, limited professional support and uneven institutional readiness (Aruleba and Jere, 2022). Its value lies in showing that ICT integration in CLCs is a mediated process in which infrastructure becomes educationally meaningful only when access and pedagogy are aligned.

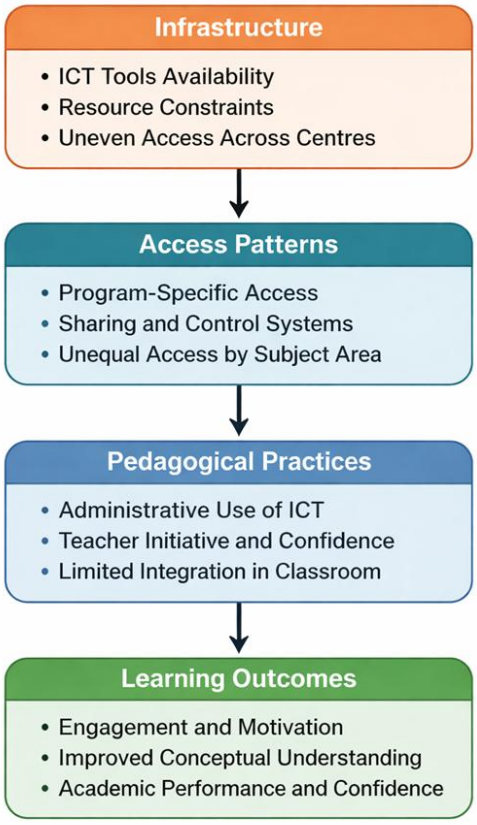


Figure 1: Revised Conceptual Model of ICT Integration in Adult Basic Education and Training CLCs

Source: Author's own analysis (2026).

5.7.4.2 Activity Theory Alignment

Figure 2 presents the extended conceptual model of ICT integration in ABET from an Activity Theory and Diffusion of Innovations perspective. The Activity Theory component explains ICT integration as an activity system involving subjects, tools, rules, community, division of labour

and object. In this study, the subjects are adult educators and adult learners, while the tools include computers, projectors, internet connectivity, printers, digital platforms and other ICT resources available in the centres. The object of the activity system is effective ICT-assisted teaching and learning in ABET, while the outcome is improved learner engagement, understanding, digital literacy and institutional effectiveness. Rules are reflected in access arrangements, booking systems, institutional policies and resource-sharing procedures. The community includes educators, learners, centre managers, administrative staff, ICT support structures and external partners. The division of labour refers to the distribution of responsibilities for teaching, managing ICT resources, maintaining devices, supporting learners and coordinating institutional ICT use. Engeström (2001) argues that activity systems are shaped by interactions among these components, while contradictions within the system may either constrain or stimulate change. This is relevant to the present study because ICT tools were available in the two centres, yet their pedagogical use was constrained by access rules, resource shortages, limited support and unclear responsibilities. The model therefore positions ICT integration not as an individual educator problem, but as a systemic process requiring alignment between resources, rules, responsibilities and pedagogical goals.

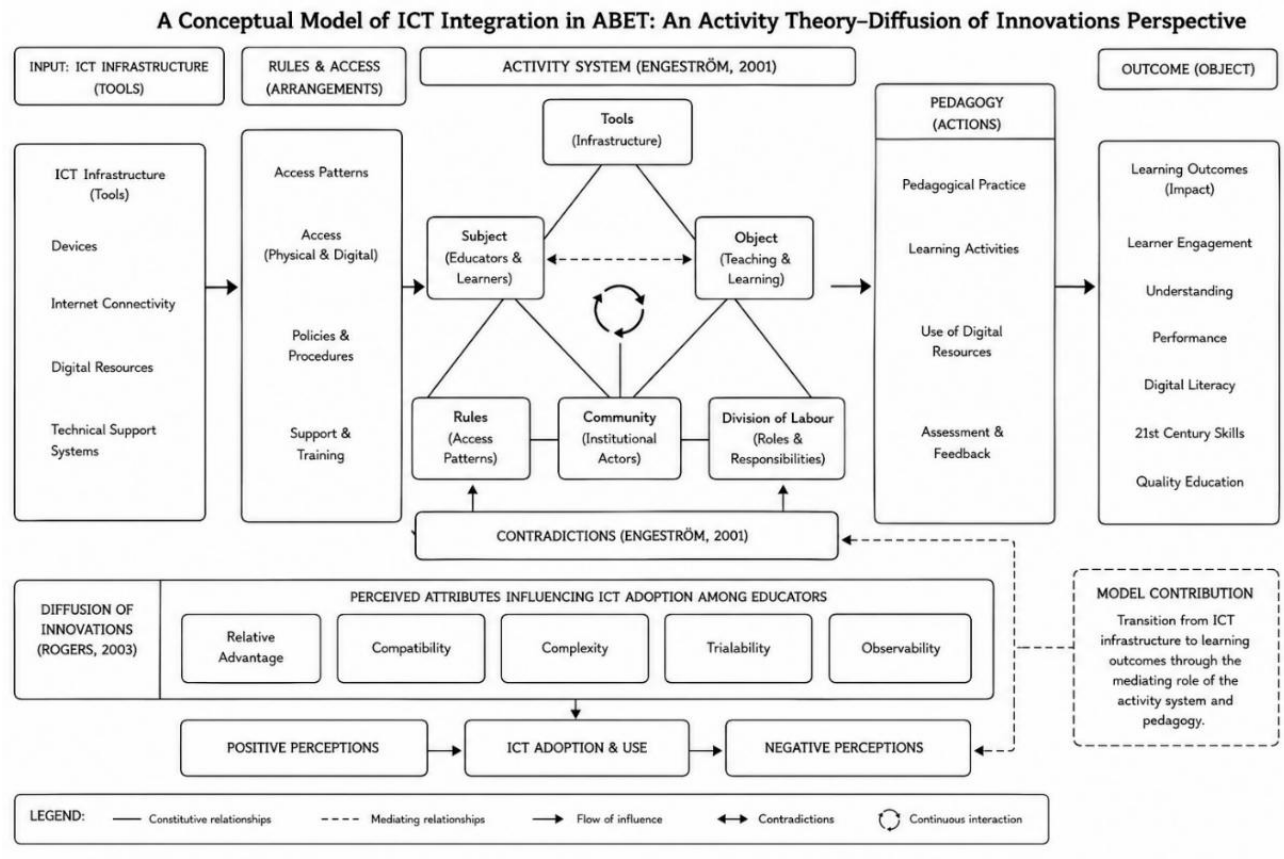


Figure 2: A Conceptual Model of ICT Integration in ABET: An Activity Theory–Diffusion of Innovations Perspective

Source: Researcher's own construction based on thematic findings and theoretical interpretation (2026).

The Activity Theory alignment in Figure 2 further highlights the contradictions that shaped ICT integration in the selected CLCs. One contradiction occurred between tools and object, since ICT resources existed but were used mainly for administration, preparation and occasional demonstration rather than sustained classroom-based teaching. Another contradiction occurred between rules and tools, as booking systems, restricted access and shared-resource arrangements limited the flexibility required for responsive teaching. A further contradiction occurred between community and division of labour, because ICT integration was often dependent on individual educator initiative instead of coordinated institutional support. These findings correspond with studies, showing that South African educational institutions often struggle to translate ICT access into meaningful pedagogical use because infrastructure, professional development and organisational support are not sufficiently aligned (Mnisi, Mtshali and Makgato, 2024). They also resonate with research on adult educators in

community college contexts, where institutional conditions shape how educators understand and perform their professional roles (Land, 2021). The model therefore clarifies why ICT integration in ABET cannot be adequately explained through educator willingness alone. It requires attention to the wider activity system in which educators, learners, managers, tools and institutional rules interact.

5.7.4.3 Diffusion of Innovation Integration

The Diffusion of Innovations component of Figure 2 explains how educators' adoption of ICT was influenced by perceived relative advantage, compatibility, complexity, trialability and observability. ICT was more readily adopted where educators and learners perceived its relative advantage, especially in relation to visual demonstrations, practical examples, learner engagement and lesson preparation. In practical learning areas, such as sewing, wholesale and retail, and ICT-related subjects, the compatibility of technology with instructional activities was more visible because videos, projections and demonstrations could be directly linked to learning tasks. Rogers (2003) explains that innovations are more likely to be adopted when they are perceived as useful, compatible with existing practice and observable in their benefits. Abel et al. (2022) similarly show that adult educators' perceptions influence whether ICT becomes part of classroom instruction. However, the study also found that ICT adoption was weakened by perceived complexity, unreliable access, limited training and restricted opportunities for experimentation. These findings align with Kafu-Quvane's (2021) argument that educators' experiences of ICT integration are shaped by classroom conditions and institutional context. The model therefore shows that ICT adoption in ABET depends not only on educators' attitudes, but also on whether the institutional environment allows educators to test, observe and adapt technology for adult-centred teaching.

The integration of Diffusion of Innovations Theory also explains why ICT adoption differed across learning areas and between the two centres. Where ICT was clearly connected to practical demonstrations or visible learner engagement, educators were more likely to use it. Where its relevance to the subject was unclear, or where educators lacked pedagogical training, ICT use remained limited or administrative. This confirms that adoption is not simply a technical decision; it is shaped by perceived usefulness, subject relevance, institutional support and confidence in use (Bokolo, 2023). In South African adult education, this is particularly important because learners often enter CLCs with diverse literacy levels, educational histories and digital exposure (Akintolu and Letseka, 2021). ICT must therefore be introduced in ways

that are compatible with adult learning needs rather than imposed as a generic digital requirement. The model also indicates that restricted access reduces trialability, while limited sharing of successful ICT practices reduces observability. Consequently, even when educators recognise the possible value of ICT, adoption remains uneven unless centres create conditions for experimentation, peer learning and visible demonstration of pedagogical benefits.

5.7.4.4 Contribution of the Model

The contribution of the revised model lies in showing that the transition from ICT infrastructure to meaningful learning outcomes occurs through the mediating roles of access and pedagogy. The model rejects the assumption that ICT infrastructure alone can transform adult education. Instead, it demonstrates that ICT tools require supportive rules, equitable access arrangements, pedagogically focused professional development, educator confidence and institutional coordination before they can improve teaching and learning. This finding is important because national digital strategies often emphasise digital skills and infrastructure, while the practical realities of under-resourced learning institutions reveal deeper implementation challenges (Department of Communications and Digital Technologies, 2020). The model also extends existing research on digital inequality by showing that access is not only about whether a centre owns ICT tools, but also about who can use them, under what conditions, how frequently and for what pedagogical purpose (Aruleba and Jere, 2022). This is especially relevant in ABET because CLCs serve learners who may already have experienced educational and social exclusion (Daniels, 2020). The model therefore contributes a context-specific explanation of ICT integration in adult education, where technological presence must be converted into pedagogical availability.

The model also consolidates the study's conceptual contribution through the ideas of conditional presence, hidden privatisation and the pedagogical-digital divide. Conditional presence refers to situations where ICT infrastructure exists physically but remains only partially useful because access is regulated, uneven or unreliable. Hidden privatisation refers to the informal transfer of ICT costs to educators and learners when they use personal devices, data or technical effort to compensate for institutional gaps. The pedagogical-digital divide refers to the gap between basic ICT access or operational competence and the ability to use ICT meaningfully for adult-centred teaching, assessment and learner engagement. These concepts advance the discussion beyond a narrow digital divide framing by showing that the central problem is not only access to technology, but the conditions under which technology

becomes educationally useful. This interpretation is consistent with studies showing that educator digital competence must be connected to institutional support and pedagogical application (Nyathi and Joseph, 2024). It also aligns with evidence that digitalisation in community education and training is constrained by barriers affecting both educators and learners (Nchabeleng, 2024). The model therefore offers a diagnostic and practical framework for understanding why ICT integration in CLCs remains fragmented and what forms of support are required to make it more pedagogically effective.

5.8 Chapter Summary

This chapter presents a comprehensive analysis of the study's findings in relation to the four research questions. An analysis of empirical data reveals that several system-level problems beset the incorporation of ICT into CLCs. These include insufficient infrastructure integration, unreliable access, underutilisation of classrooms, and an incomplete professional development continuum. Although most centres have ICT facilities, these facilities do not seem to contribute much to teaching practice, suggesting that mere access is not sufficient for effective ICT use. The chapter further revealed that the integration of ICT largely relies on the individual practitioner’s initiative, which occurs against the backdrop of fragmented institutional policies, leading to divergent practices in learning areas and centres.

Moreover, the results show that adults and their instructors both view ICT as playing a vital role in learning by increasing learners' involvement in class activities, improving understanding of concepts, and fostering self-confidence. Despite these advantages, the actualisation of ICT use may be prevented by factors such as unequal access to the internet, scarce resources, and insufficient training, among others. The discussion in this chapter focuses on ICT adoption in education from a perspective that views the challenges as structural rather than administrative. Therefore, this chapter highlights the need to adopt a more systemic perspective to solve the problem.

Chapter 6 presents the conclusions drawn from the study together with recommendations for strengthening ICT integration in adult education in South Africa. It also presents the revised conceptual model developed from the findings and explains how the model extends the study’s theoretical interpretation.

The results of this study indicate a need to revise the initial theoretical framework for ICT integration in adult education. The integration of ICT into ABET is determined not only by educators' individual actions and efforts, but also by several institutional and structural factors.

While the initial model based on Activity Theory focused on the educator and ICT as the tool for improving the teaching and learning process, the findings indicate the presence of certain contradictions among institutional policy, infrastructure, and pedagogy. These contradictions are reflected in the fragmented use of ICT, where educators, despite being able to use it, do so in isolation due to institutional and structural constraints.

The new conceptual model includes the idea of ‘systemic support’, which plays an important role in the effective implementation of ICT. Systemic support comprises components such as a supportive policy framework, professional development, and alignment across organisational levels, enabling the implementation of the ICT system. The new model also integrates components of Rogers's Diffusion of Innovation Theory, namely the impact of institutional context on the evaluation of the tool's relative advantage, compatibility, complexity, trialability, and observability. Thus, using both theories, the author elaborates the revised conceptual model that describes ICT implementation in adult education.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter presents the conclusions and recommendations from the investigation of ICT integration in teaching and learning at two CLCs in South Africa. This chapter synthesises the findings of Chapter 4 and interpretations made in Chapter 5 through summarising the key conclusions regarding ICT accessibility, utilisation trends, pedagogical merit, and training and support. The aim of the chapter is not to detail all the findings from the empirical work, but rather to answer the research questions posed and to highlight how the findings can be used to enhance ICT integration in CLCs.

The chapter is divided into seven different parts. Part 6.2 focuses on the conclusion based on the answers to the four research questions posed in the study. Part 6.3 gives the overall conclusion drawn from the study, particularly paying close attention to the holistic approach taken in ICT integration within CLCs. Part 6.4 contains recommendations at the policy, institutional, professional development, and pedagogical levels. Part 6.5 contains a plan of action. Table 8 is the implementation table, which includes who should take responsibility for what, when it should be done, what will show that the task was successful and what resources are needed.

6.2 Summary of Key Conclusions

6.2.1 Conclusion on Research Question 1: What ICT tools are currently available and accessible to adult educators in CLCs?

It was found that basic ICT tools were available in the chosen CLCs, but their availability did not necessarily translate into accessibility. These included desktops, computer labs, printers, photocopiers, projectors, routers, Wi-Fi connectivity, laptops, smart screens, and even more sophisticated ICT tools, such as a 3D printer and a digital camera, in one CLC. It was revealed that the distribution of these tools was uneven in both centres and between learning areas. There was an unequal distribution between ICT and non-ICT subjects, with some educators relying on shared tools and prior institutional authorisation to use available equipment. Hence, the conclusion is that tools were available but only conditionally accessible.

In addition, the study revealed that ICT access was determined by the nature of the resources, the reliability of internet connectivity, and maintenance procedures. The ICT facilities were at times broken and took a long time to repair, and in some instances were inaccessible when

required for instruction. From an Activity Theory perspective, the ICT tools were part of the activity system, but there was a contradiction between the tools and the rules of use, due to procedures that limited their use in class settings. Furthermore, there was a contradiction between the objective of enhancing education and the division of labour, in which maintenance was performed by educators rather than by technical staff. It therefore follows that ICT access in CLCs cannot be determined solely by the availability of equipment.

6.2.2 Conclusion on Research Question 2: How frequently, in what ways, and to what extent do adult educators integrate ICT into teaching and learning practices?

Furthermore, the results indicate that accessibility was influenced by resource state, internet reliability, rules of use, and maintenance capabilities. Some ICT were found faulty and required a lot of time to fix, while others were inaccessible due to lack of use when needed for teaching. In terms of Activity Theory, these ICT formed the part of the activity system. However, a contradiction arose between ICT tools and the rules owing to the access process which prevented flexibility in classroom use. Also, a contradiction existed between the object, the improvement of the teaching and learning process, and the division of labour, since some maintenance duties were assigned to educators in an informal setting. Thus, ICT accessibility at CLCs cannot be determined solely by the availability of ICT.

Furthermore, it is established that there was greater integration of ICT in subjects with practical, skill-based content than in those with literacy-oriented content. The content in sewing, wholesale and retailing, entrepreneurship, and ICT-related fields was more closely integrated with ICT through the teaching approach, which used video demonstrations. Other areas failed to integrate ICT into the learning process because educators lacked appropriate models for ICT integration specific to different subjects. This represents a contradiction, since the object and the community of practice were not in agreement regarding ICT integration in the learning centres.

6.2.3 Conclusion on Research Question 3: What are adult educators' perceptions of the pedagogical value and effectiveness of ICT integration?

The conclusion is that both educators and adult learners have found ICT pedagogically important. In their view, ICT contributed to increased motivation and engagement among learners, better participation in class discussions and activities, deeper conceptual understanding, and increased confidence. It was acknowledged that videos, images, demonstrations, and projections helped explain and illustrate complex ideas. ICT had special

significance for adult education due to the diversity of learners' educational backgrounds, literacy levels, learning speeds, and confidence, among other factors. In the described case, visual and multimodal approaches seemed more attractive than traditional text-based explanations. This is how the study concluded about the pedagogical importance of ICT in ABET.

Nonetheless, the paper indicates that caution is necessary regarding the above perceptions. The research used subjective measures to evaluate the effects of ICT-supported pedagogy on learners' academic success, relying on participants' perceptions rather than pre- and post-ICT-supported pedagogy academic success measures. In this case, the research can state that ICT-supported teaching had a positive impact on learners' academic success through increased engagement, comprehension, and confidence. However, the research suggests that some of these perceptions may have arisen from the use of new technology rather than conventional approaches.

Another conclusion that can be drawn from this research is the existence of the pedagogical-digital divide in CLCs. In this paper, the pedagogical-digital divide is described as the difference between mere access to computers/ICT devices or mere functional skills for using ICT devices and the ability to utilise ICT meaningfully for the purpose of teaching a curriculum, engaging learners in educational activities, assessing them and teaching adults. Thus, the pedagogical-digital divide differs from a generic definition of the digital divide because it is not only concerned with the availability of computers or ICT tools but also with educators' ability to utilise their potential through relevant pedagogical knowledge and appropriate strategies, which allow transforming the physical presence of technology into pedagogically meaningful actions. The pedagogical-digital divide is operationalised as a construct comprising four variables: insufficient shift from ICT use in administrative contexts to the classroom, uneven use of ICT across all learning areas, lack of pedagogical training, and reliance solely on educators' efforts and initiatives.

6.2.4 Conclusion on Research Question 4: What ICT-related professional development opportunities are available to adult educators in ABET, and how relevant and frequent are these opportunities?

The findings suggest that although there were opportunities for professional development in ICT, they were inadequate, inconsistent, and focused solely on developing ICT skills for basic literacy purposes. Educators identified opportunities to participate in user computing

education, general computer training, online learning, and ICT training in connection with the DHET. It is noted, however, that such opportunities were not consistently made available to all educators, nor were they aligned with the pedagogical requirements of ABET instruction. ICT educators and centre managers had greater opportunities for professional development than other educators working outside ICT instruction areas.

In addition, the study found that professional development was inadequate in areas such as lesson planning, learners' involvement, assessment methods, adult learning principles, and the subject-specific application of ICT. There is an inconsistency between professional development and the objectives of ICT-enabled teaching and learning: the centres expected their educators to use ICT, while the professional development structure did not equip all educators with adequate pedagogical means to do so. Inadequate professional development, particularly ICT development that would have been ongoing, structured, and compulsory, was one of the reasons for poor classroom utilisation of ICT.

6.3 Overall Conclusion of the Study

The study concludes that ICT integration within CLCs in South Africa should be understood as a systemic educational process rather than a purely technical intervention. The findings show that the central problem is not only the shortage of ICT resources, but also the uneven distribution of available resources, unreliable access, inadequate maintenance, limited connectivity and insufficient professional development. This finding is consistent with Aruleba and Jere's (2022) observation that digital transformation in under-resourced South African contexts is constrained by infrastructure, cost and institutional capacity. It also supports Abel, Tondeur, and Sang's (2022) view that educators' perceptions and contexts influence whether ICT is integrated meaningfully into teaching. The study therefore rejects the assumption that the mere provision of ICT equipment will automatically improve teaching and learning. Instead, ICT integration in CLCs requires alignment between infrastructure, access arrangements, educator competence, institutional rules, management support and adult-centred pedagogy.

The study further concludes that the marginal position of adult education within broader digital transformation agendas influences how ICT is experienced and used in CLCs. Although South African digital policy recognises the importance of digital skills, unresolved issues remain at the implementation level, especially regarding infrastructure, maintenance, training, and institutional responsibility (Department of Communications and Digital Technologies, 2020).

The findings suggest a gap between national policy intentions and the practical realities of CLCs, where digital transformation remains uneven and dependent on local institutional capacity. This conclusion aligns with Belete et al. (2022), who emphasise that CLCs are embedded in community realities and therefore require context-sensitive support. It also reflects Daniels' (2020) argument that adult education has transformative potential only when it responds to the conditions of marginalised learners. From an Activity Theory perspective, this gap represents a contradiction between the tools available, the rules governing their use, the community responsible for implementation, the division of labour and the object of improving teaching and learning (Engeström, 2001).

The study also contributes three related concepts that help explain ICT integration in CLCs more precisely. The first is conditional presence, which refers to situations where ICT infrastructure exists physically but is not fully available for pedagogical use because access is restricted, unevenly distributed, poorly maintained or unreliable. The second is hidden privatisation, which describes the informal transfer of ICT-related costs to educators and learners when they use personal laptops, mobile phones, data, modems, or their own technical effort to compensate for institutional gaps. The third is the pedagogical-digital divide, which refers to the gap between having basic ICT access or operational ICT skills and being able to use ICT meaningfully for adult-centred teaching, learner engagement, assessment and curriculum delivery. These concepts extend the conventional digital divide argument by showing that the problem is not only whether ICT tools exist, but whether they are accessible, supported and pedagogically usable. This interpretation is consistent with Nyathi and Joseph's (2024) argument that digital teaching competence depends on both educator development and institutional support.

Overall, the study concludes that ICT integration in CLCs remains fragmented, conditional and structurally constrained. ICT was perceived as valuable for learner engagement, visualisation, motivation, confidence and conceptual understanding, but these benefits were limited by uneven access, weak maintenance systems, insufficient training and the absence of structured pedagogical guidance. The findings show that CLCs require more than devices; they require coordinated systems of support that connect policy, infrastructure, professional development and classroom practice. This conclusion is important because adult learners often rely on CLCs as second-chance learning spaces, yet they remain vulnerable to exclusion if digital learning systems are not equitably implemented. The study, therefore, positions ICT integration as a social justice issue within adult education, because meaningful digital participation depends on

institutional conditions that enable both educators and learners to use ICT for educational advancement.

6.4 Recommendations

6.4.1 Policy-Level Recommendations

1. DHET should develop a CET-specific ICT integration policy that sets minimum standards for connectivity, device access, maintenance, pedagogical use and accountability in CLCs.

2. Provincial CET structures should establish equitable minimum ICT-access arrangements across ICT and non-ICT learning areas and monitor implementation through centre-level schedules and usage records.

6.4.2 Institutional Recommendations for CLCs

3. Each CLC should implement a transparent ICT booking and access schedule so that shared resources are available predictably to educators and learners across learning areas.

4. Each CLC should maintain an ICT fault and maintenance register, designate responsibility for follow-up, and escalate unresolved connectivity or equipment failures through the relevant CET management structure.

5. Centres should establish peer-led ICT support in which confident educators share practical lesson ideas and assist colleagues with routine technology use.

6.4.3 Professional Development Recommendations

6. Adult educators should receive at least one structured pedagogical ICT-development opportunity each year, focused on subject-specific classroom application rather than general digital literacy alone.

7. Professional development should be followed by evidence of classroom application, such as an ICT-integrated lesson plan, peer reflection or demonstration, so that training is linked to teaching practice.

6.4.4 Pedagogical Recommendations

8. Educators should use ICT to make adult learning more visual, practical and context-relevant, including demonstrations, short videos, projected examples and guided information searches linked to learning outcomes.

9. ICT activities should be introduced progressively and include support for learners with limited prior digital experience so that technology does not become an additional barrier to participation.

10. Claims about the effect of ICT on achievement should be based on evidence. Educators should use formative assessment, learner feedback and task performance to evaluate whether an ICT-supported activity improved understanding before attributing changes in performance to technology.

6.5 Implementation Table for Recommendations

Table 8: Implementation Table for Recommendations

Recommendation	Responsible actor	Timeline	Success indicator	Estimated resources
Develop a CET-specific ICT integration policy for CLCs	DHET national CET branch, in consultation with provincial CET directorates and CLC representatives	12–18 months	Approved CET-specific ICT policy with minimum ICT standards, access requirements, maintenance provisions and reporting obligations	Policy development team, stakeholder consultation workshops, administrative budget and technical advisory support
Introduce minimum ICT access hours for all learning areas	Provincial CET directorates, implemented by CLC centre managers	6–12 months	ICT access timetable implemented across ICT and non-ICT learning areas	Existing timetable structures, centre-level planning time and monitoring templates
Establish annual pedagogical ICT training for all adult educators	DHET national CET branch and provincial CET directorates, supported by accredited training providers	Annually	All adult educators complete at least one pedagogical ICT training session per year	Training facilitators, digital materials, venue or online platform access and professional development budget

Recommendation	Responsible actor	Timeline	Success indicator	Estimated resources
Create internal ICT access schedules and booking systems	CLC centre managers and designated centre ICT coordinators	Immediate to 3 months	Written ICT timetable and booking register used consistently by educators and learners	Administrative coordination, booking templates and staff meeting time
Create peer-led ICT support groups	CLC centre managers, designated ICT coordinators and ICT-confident educators	Immediate to 6 months	Regular peer-support sessions held and shared ICT lesson ideas documented	No major cost; staff collaboration time and internal meeting space required
Establish ICT maintenance logs	Designated CLC ICT coordinators, supervised by centre managers	Immediate to 3 months	Maintenance register records reported faults, follow-up actions, responsible persons and dates of resolution	Maintenance log template, basic reporting system and management follow-up time
Allocate ring-fenced maintenance funding	DHET national CET branch and provincial CET finance units, implemented through CLC operational budgets	Within 12 months	Annual budget line created for ICT repairs, connectivity and minor replacement of devices	Dedicated maintenance allocation, budget reallocation or conditional infrastructure support
Improve connectivity and access to low-cost digital resources	Provincial CET directorates, CLC centre managers, internet service providers and public-private partners	12–24 months	More stable internet access and fewer disruptions during ICT-supported teaching and learning	Connectivity funding, service-level agreements, public-private partnerships and low-cost digital resource packages

Recommendation	Responsible actor	Timeline	Success indicator	Estimated resources
Develop subject-specific ICT lesson exemplars	Provincial curriculum support officials, adult education subject specialists and experienced adult educators	6–12 months	ICT lesson exemplars available for practical, literacy, numeracy and vocational learning areas	Curriculum development time, educator workshops and digital exemplar repository
Monitor ICT integration through annual centre reports	CLC centre managers submit reports to provincial CET directorates; DHET national CET branch consolidates sector-level trends	Annually	Annual reports include ICT access, usage, educator training, maintenance and learner-support indicators	Reporting templates, administrative support and provincial monitoring capacity

6.6 Recommendations for Future Research

Future research should examine the relationship between ICT-supported teaching and measurable learner outcomes in CLCs. A possible research question is: How does ICT-supported teaching influence learner engagement, attendance, participation and assessment performance in ABET learning areas over one academic year? A mixed-methods design would be suitable because it could combine classroom observations, attendance records, learner assessment results, and interviews with educators and learners. The study could compare learners exposed to structured ICT-supported lessons with a comparable group receiving mainly conventional instruction. Such a design would strengthen the evidence base by moving beyond perceptions of improved learning and testing whether ICT-supported teaching is associated with observable learner progress.

Future research should also investigate the effect of sustained pedagogical ICT professional development on adult educators' teaching practices. A possible research question is: What impact does 'structured' pedagogical ICT training over one academic year have on adult educators' confidence, lesson design, classroom ICT use and learner engagement compared with educators who receive only general ICT training? This study could use a quasi-experimental or comparative qualitative design involving a training group and a comparison

group. Data could be collected before the intervention, immediately after the training and at the end of the academic year. Such research would help determine whether pedagogical ICT training produces more meaningful classroom integration than basic computer literacy training alone.

Further research should examine ICT integration across a larger number of CLCs in different provincial and geographical contexts. A possible research question is: How do institutional processes, resource distribution and management support influence ICT integration across urban, peri-urban and rural CLCs in South Africa? Such a study could include centre managers, adult educators, adult learners, district officials and provincial CET representatives. A multiple-case study across several provinces would allow comparison of better-resourced and under-resourced centres. This would help establish whether the challenges identified in the present study are localised to the two selected centres or reflect wider patterns within the CET sector.

A further area for research concerns the pedagogical-digital divide in adult education. A possible research question is: What indicators can be used to measure the gap between basic ICT access and pedagogically meaningful ICT use among adult educators in CLCs? This research could develop and validate an instrument measuring ICT access, educator digital competence, pedagogical ICT knowledge, subject-specific ICT application and institutional support. Such a study would make a methodological contribution by providing a practical tool for diagnosing ICT integration readiness in adult education settings. It would also help policymakers and centre managers identify whether the primary challenge in a given centre relates to infrastructure, educator training, access arrangements or pedagogical application.

6.7 Limitations of the Study

The first limitation was the modest sample of 10 participants across two CLCs. The study was designed for depth and transferability rather than statistical generalisation. This limitation was mitigated by purposive selection of information-rich participants, equal representation across the two cases, inclusion of educators, learners and managers, and cross-case comparison. Readers should therefore assess transferability against the detailed contextual description rather than treat the findings as population estimates (Sebele-Mpofu, 2020; Naeem et al., 2024).

The second limitation was reliance primarily on self-reported interview accounts. No classroom observations were conducted to independently verify the frequency or quality of ICT use during live teaching. This limitation was partly mitigated through separate interviews with three stakeholder groups, comparison across the two cases, field notes, member checking and

supplementary document analysis. Future studies should include structured classroom observations and, where feasible, usage records.

The third limitation was the absence of pre- and post-test measures or direct grade data. Participants reported perceived improvements in confidence, understanding and assessment readiness, but the design could not establish that ICT caused improved academic performance. The thesis therefore reports these outcomes as perceived academic improvement. Future studies should combine qualitative accounts with longitudinal or quasi-experimental measures of learning outcomes.

The fourth limitation concerned potential researcher bias. The researcher's prior experience in adult education supported contextual understanding but could also shape interpretation. Reflexive notes, repeated transcript reading, direct quotation, member checking, peer review of themes and an audit trail were used to make interpretive decisions more transparent. The findings are therefore presented as a reasoned interpretation grounded in participant accounts rather than as an objective measurement of ICT integration.

The fifth limitation concerns transferability beyond the selected Eastern Cape cases. CLCs in other provinces and in urban, peri-urban or differently resourced settings may operate under different conditions. This limitation was addressed through explicit case boundaries and contextual description. Future multi-site research should test whether the concepts identified here - particularly conditional presence, hidden privatisation and the pedagogical-digital divide - remain useful across a wider range of CET settings.

6.8 Concluding Remarks

From this research, it can be said that ICT integration in CLCs depends on the relationships among infrastructure and accessibility issues, as well as educators' competencies. The results suggest that ICT equipment is available in the selected CLCs, but its use is restricted by unequal access to these resources, inadequate maintenance, a lack of pedagogical competence, and poor institutional coordination. Therefore, this research sheds some light on ICT integration as a complex educational phenomenon rather than technology acquisition. Moreover, this research demonstrates the relevance of the pedagogical digital divide concept as an explanation of the mismatch between the availability of ICT and their appropriate use in adult education.

The study's findings also indicate that adult educators and learners appreciate the role that ICT plays in engagement, motivation, understanding concepts, and in learners' confidence levels.

The benefits derived from ICT continue to depend on availability, access, training, and support. If this is not done and the challenges highlighted in this study persist, ICT-based approaches will continue to perpetuate the existing inequities in the adult education system. ICT integration in the ABET setting will have to involve policy guidance, infrastructure provision, all-encompassing professional development, centre-level accountability, and pedagogy that considers the needs of adult learners.

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APPENDICES

Appendix A: Ethical Clearance Letter

Approval letter obtained from the university ethics committee authorising the study.

UNISA university of south africa

College of Education _ERC

NHREC Registration # : (if applicable)
Ref #: 7795
Name: Mr Khethokwakhe Goodman Chonco
Student #: 44904452
Staff #:

Date: 13/08/2025

Dear: Mr Khethokwakhe Goodman Chonco

Decision: Ethics Approval from 13/08/2025 to 12/08/2030

Researcher: Mr Khethokwakhe Goodman Chonco

Plot 10, R28 Service Road,

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Supervisor: Dr Khanyisile Mbatha MBATHK1@UNISA.AC.ZA

Co-Supervisor:

Co-Researcher(s):

Email address:

The Status of Information and Communication Technology Integration in Teaching and Learning in South Africa Adult Education

Qualification: DED

Thank you for the application for research ethics approval by the College of Education _ERC for the above-mentioned research study. Ethics approval is granted for five years.

The **negligible risk application** was **reviewed** by the College of Education _ERC in compliance with the Unisa Policy on Research Ethics and the Standard Operating Procedure on Research Ethics Risk Assessment.

The proposed research may now commence with the provisions that:

1. The researcher(s) will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.
2. Any adverse circumstance arising during the undertaking of the research study that may affect the ethical integrity of the study, including those involving research participants, third parties, or juristic persons, must be reported in writing to the College of Education _ERC without delay.
3. The researcher(s) will conduct the study according to the methods and procedures set out in the approved application.
4. Any changes that may affect study-related risks to research participants, juristic or third persons, must be reported in writing to the College of Education _ERC, accompanied by a progress report.

Page 1 of 2

5. The researcher will ensure that the research study complies with all applicable national legislation, professional codes of conduct, institutional guidelines, and scientific standards relevant to the specific field of study. Where applicable, adherence to the following South African legislation is essential: the Protection of Personal Information Act (No. 4 of 2013), the Children's Act (No. 38 of 2005), and the National Health Act (No. 61 of 2003)

6. Future use of this research data is permitted only in de-identified form and only for secondary research with objectives similar to those of the original study. Any secondary use involving identifiable human data will require additional ethics clearance.

7. No fieldwork activities may continue beyond the stated expiry date (12/08/2030). A completed Research Ethics Progress Report must be submitted as an application for renewal and is subject to approval by the Research Ethics Committee. A Close-Out Report must be submitted upon completion of the research study.

8. The College of Education _ERC Adult Community and Continuing Education may require the submission of regular progress reports on an annual basis, in alignment with Section 7.2 of the Unisa Policy on Research Ethics (2024).

Additional Conditions

1. Disclosure of data to third parties is prohibited without explicit consent from the research participants and Unisa.
2. Research data must be stored in compliance with the university's research data management policy for a period of up to 15 years.
3. When publishing the results, the researcher must take appropriate precautions to safeguard the confidentiality and privacy of the research participants, juristic persons, third parties, and the university, in accordance with institutional policies and ethical standards.
4. Adherence to the National Statement on Ethical Research and Publication Practices, specifically Principle 7 on Social Awareness, must be ensured. This principle states: 'Researchers and institutions must be sensitive to the potential impact of their research on society, marginal groups, or individuals, and must consider these when weighing the benefits of the research against any harmful effects, with a view to minimising or avoiding the latter where possible.' The University of South Africa (Unisa) accepts no liability for any failure to comply with this principle.

Note

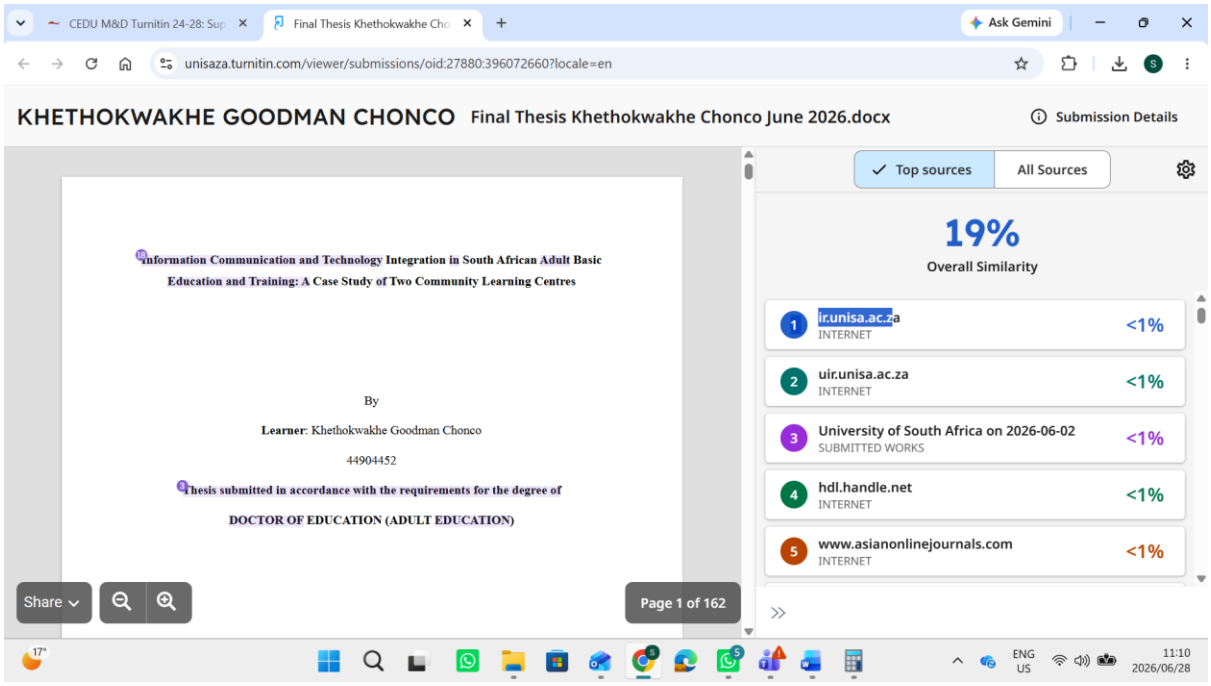
The reference number 7795 should be clearly indicated on all forms of communication with the intended research participants, as well as with the Committee.

Kind regards,

Prof Reginald Monyai
Chair of College of Education _ERC
E-mail: monyarb@unisa.ac.za

Professor Mpine Makoe,
Executive Dean / By delegation from the Executive Dean of College of Education _ERC
E-mail: qakisme@unisa.ac.za, magolmc@unisa.ac.za

Appendix B: Turnitin Report



Similarity Report

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Final Thesis Khethokwakhe Chonco June 2026.docx

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Appendix C: Editor certificate

EDITORIAL & PROOF READING CERTIFICATE

POLISHED VIEW
PROOF READING & EDITING

DATE: 28 June 2026

DISSERTATION AUTHOR(S): Khethokwakhe Goodman Chonco

DISSERTATION TITLE: Information Communication and Technology (ICT) Integration in South African Adult Basic Education and Training: A Case Study of Two Community Learning Centres

To Whom It May Concern:

This letter confirms that the thesis corresponding to the information detailed therein was edited by a professional, native English-speaking editor at PolishedVIEW Proof Reading & Editing Services.

We make no claims as to the substantive matter covered by the paper and have not altered the intent or research content drafted by the author(s).

The author(s) may accept or reject any of our comments or suggestions upon receipt of the document we edited.

Should you have any questions or concerns, please contact assist.withediting@gmail.com

Sincerely,

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PolishedVIEW is a premier international English editing service. Our mission is to help researchers, scholars, and professional reach their full potential through clear communication in their writing. By providing premium English editing services at affordable ratesto clients from around the world, PolishedVIEW seeks to tear down language barriers and contribute to the advancement of research and education.

Signature



Managing Editor

Date: 28/06/2026

Appendix D: Participant Information Sheet

An information document was provided to participants explaining the purpose and procedures of the study.

Annexure: The Research Study Information Sheet

Dear Participant,

My name is Khethokwakhe Chonco, and I am a Doctor of Education student at the School of Education, University of South Africa. My research focuses on the integration of information and communication technology (ICT) in adult basic education and training (ABET). The title of my study is "Information and Communication Technology Integration in South African Adult Basic Education and Training: A Case of Two Community Learning Centres in Eastern Cape"

This study aims to contribute to the ongoing discussion about the use of ICT in education, particularly within the context of South African ABET. By examining the current status of ICT utilisation in these settings, the research aims to provide a comprehensive understanding of the barriers and factors influencing ICT adoption in ABET environments. The findings of this study could offer policymakers, educators, and administrators' valuable insights. Policymakers may benefit from data-driven recommendations to inform policies that support ICT infrastructure, funding, and training programs specifically designed for ABET. For educators, understanding how to effectively integrate ICT into adult learning programs will help develop teaching strategies that increase engagement and improve learning outcomes for adult learners. Additionally, the study highlights the unique challenges ABET learners face, including varying levels of digital literacy, which can help administrators implement targeted support measures to enhance ICT accessibility and usage in community learning centres (CLCs).

The research will employ data collection methods such as semi-structured face-to-face interviews and document analysis. I kindly invite you to participate in this study. If you agree, you will be interviewed one-on-one at your community learning centre or at a location convenient to you. The interviews will be audiotaped and will take approximately one hour each.

Your name and identity will always be kept confidential in all academic writing and conference presentations about this study. Your privacy will be maintained at all times during this project, including in all published and written data resulting from the study. The data and results of the

study may be used in the future for other academic purposes, such as conference presentations, journal articles, or policy development. All research data will be destroyed between 3 and 5 years after the completion of the project.

You will not be advantaged or disadvantaged in any way. Your participation is voluntary, so you can withdraw during this project without penalty. Participating has no foreseeable risks, and you will not be paid for this study. Please let me know if you require any further information.

Thank you for your assistance in this regard.

Yours sincerely

Khethokwakhe Chonco

Appendix E: Informed Consent Form

Blank informed-consent template used for participant consent. Signed originals are retained securely as confidential research records and are not reproduced in the public thesis.

Study title: Information and Communication Technology Integration in South African Adult Basic Education and Training: A Case Study of Two Community Learning Centres in the Eastern Cape

Participant code: _____

I confirm that I received and understood the participant information sheet and had an opportunity to ask questions about the study.

I understand that my participation is voluntary and that I may refuse to answer any question or withdraw without penalty.

I understand that my identity and the identity of the participating centres will be protected through anonymisation and confidential handling of research data.

I understand that the interview may be audio-recorded only with my permission and that recordings and transcripts will be stored securely for the approved retention period.

I understand that anonymised findings may be used in the thesis, academic publications, conference presentations and related scholarly outputs.

[ ] I consent to participate in the study. [ ] I do not consent to participate.

[ ] I consent to audio recording. [ ] I do not consent to audio recording.

Participant signature/mark: _____ Date: _____

Researcher signature: _____ Date: _____

Appendix F: Interview Schedule for Adult Educators

Semi-structured interview guide used for adult educator participants.

Information and Communication Technology Integration in South African Adult Basic Education and Training: A Case Study of Teaching and Learning in Two Community Learning Centres in the Eastern Cape

Researcher: _____

Institution: _____

Date of Interview: _____

Interviewee Code: _____

Participant Category: [ ] Centre Manager [ ] Adult Educator [ ] Adult Learner

A. Interviewer Instructions

Greeting the participant warmly and explain the purpose of the study.

Read the informed consent script aloud and obtain signed consent (or verbal consent with a witness if participant cannot sign).

Reassure the participant that participation is voluntary, they may refuse to answer any question, withdraw at any time, and responses will remain confidential.

Use the guide flexibly, allow participants to elaborate, ask follow-up questions when needed.

Record the interview (with consent) and also take written notes.

B. Informed Consent Script

"Thank you for agreeing to meet with me today. I am conducting a study on the status of ICT integration in teaching and learning in South African Community Learning Centres (CLCs). The purpose is to understand the opportunities, challenges, and experiences of using ICT in adult education.

Your participation is voluntary, and you can stop at any time. There are no right or wrong

answers, and everything you say will be kept confidential. In reporting, your name will not be used, only codes will identify participants.

This interview will take about 30–45 minutes. With your permission, I would like to record the conversation so that I do not miss anything. Do I have your consent to proceed?"

[ ] Yes, participant consents [ ] No, participant does not consent

Signature/Mark of Participant: _____

Date : _____

2. Adult Educators

Can you tell me about your teaching role and your experience with ICT in this centre?

Notes :_____

_____

_____

_____

What ICT tools do you use in your teaching?

Notes :_____

_____

_____

_____

How often do you use them, and for what activities?

Notes :_____

_____

_____

_____

Can you share an example of how you have integrated ICT into a lesson?

Notes :_____

_____

_____

_____

What challenges do you face in using ICT for teaching?

Notes :_____

_____

_____

_____

Have you received any training on ICT use? How useful was it?

Notes :_____

_____

_____

_____

What kind of support do you receive from the centre when using ICT?

Notes :_____

_____

_____

_____

How has ICT affected your teaching methods?

Notes :_____

_____

_____

_____

In your view, how has ICT influenced learner engagement or performance?

Notes :_____

_____

_____

_____

What would help you use ICT more effectively in teaching?

Notes :_____

_____

_____

_____

Appendix G: Interview Schedule for Centre Managers

Semi-structured interview guide used for centre manager participants.

1. Centre Managers

Can you describe your role as a Centre Manager in supporting teaching and learning?

Notes :_____

_____

_____

_____

What ICT resources are currently available at your centre?

Notes :_____

_____

_____

_____

Are these resources sufficient and reliable for daily teaching and learning?

Notes :_____

_____

_____

_____

How do you ensure educators and learners are able to use ICT resources?

Notes :_____

_____

_____

_____

What are the biggest challenges your centre faces with ICT integration?

Notes :_____

_____

_____

_____

What policies or guidelines influence ICT use in your centre?

Notes :_____

_____

_____

_____

How does your centre support educators and learners to use ICT effectively?

Notes :_____

_____

_____

_____

In your opinion, what has been the impact of ICT on teaching and learning so far?

Notes :_____

_____

_____

_____

What additional support is needed to strengthen ICT use at your centre?

Notes :_____

_____

_____

_____

Appendix H: Interview Schedule for Adult Learners

Semi-structured interview guide used for adult learner participants.

3. Adult Learners

Can you tell me about your learning journey here at the centre?

Notes :_____

_____

_____

_____

What ICT tools (computers, phones, internet, etc.) do you use for learning?

Notes :_____

_____

_____

_____

How often do you use these tools in your studies?

Notes :_____

_____

_____

_____

How do your educators use ICT in class? How does this help your learning?

Notes :_____

_____

_____

_____

What difficulties do you face when using ICT?

Notes :_____

_____

_____

_____

Have you received any training or support to help you use ICT?

Notes :_____

_____

_____

_____

Who supports you most in using ICT (educators, peers, family)?

Notes :_____

_____

_____

_____

How do you feel ICT has changed your learning experience?

Notes :_____

_____

_____

_____

What ICT resources or support would make your learning easier or more effective?

Notes :_____

_____

_____

_____

D. Closing

"Thank you very much for sharing your experiences. Your input is very valuable to this study. Is there anything else you would like to add about ICT use in teaching and learning at this centre?"

Notes :_____

_____

_____

_____

Appendix I: Document Analysis Matrix

This matrix records the supplementary policy and strategy documents analysed and the way they were used to contextualise and triangulate the interview findings. It is an audit record of the documentary analysis described in Section 3.4.4.

Document	Reason for inclusion	Analytical focus	Relationship to interview findings
DCDT (2020), National Digital and Future Skills Strategy	National digital-skills policy context	Digital capability, inclusion, participation	Provided policy expectations against which uneven access and capability reported by participants were interpreted.
DHET (2013), White Paper for Post-School Education and Training	Locates community education within the post-school system	CET mandate, access, institutional integration	Clarified that CLCs operate within post-school CET rather than the DBE school system and framed the institutional context of the cases.
ETDP SETA (2021), Adult and Community Education Training Colleges report	Sector-specific evidence on adult/community education	Institutional capacity, educator development, resource needs	Supported interpretation of participants' reports of uneven institutional support and professional development.
UNESCO (2018), ICT Competency Framework for Teachers	International benchmark for educator ICT competence	Pedagogical ICT competence, professional development	Provided a benchmark for distinguishing general digital skills from pedagogically focused ICT capability.