DEVELOPING A PEDAGOGICAL FRAMEWORK FOR BLENDED DISTANCE LEARNING AT THE NATIONAL UNIVERSITY OF LESOTHO

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Dedication

I dedicate this work with much love to the founders of my being, my late parents:

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To God be the Glory!

List of acronyms

2G:	Second Generation networks or services
3G:	Third Generation networks or services
4G:	Fourth Generation cellular data technologies
ADE:	Adult Education
AfDB:	The African Development Bank
BDL:	Blended Distance Learning
BL:	Blended Learning
BMD:	Business Management and Development
CHE:	Council on Higher Education
CK:	Content Knowledge
CSU:	Computer Services Unit
CTL:	Centre for Teaching and Learning
DE:	Distance Education
ETL:	Econet Telecom Lesotho
GCSE:	General Certificate of Secondary Education
HEI:	Higher Education Institution
HEIs:	Higher Education Institutions
ICT:	Information and Communication Technology
ICTs:	Information and Communication Technologies
IEMS:	Institute of Extra-Mural Studies
IGCSE:	International General Certificate of Secondary Education
ITU:	International Communication Union
LCA:	Lesotho Telecommunications Authority
LCE:	Lesotho College of Education
LDTC:	Lesotho Distance Teaching Centre
LGCSE:	Lesotho General Certificate of Secondary Education
LMS:	Learning Management System
LP:	Lerotholi Polytechnic
LTE:	Long Term Evolution

MCST:	Ministry of Communication Science and Technology
MOET:	Ministry of Education and Training
NEPAD:	New Partnership for Africa's Development
NUL:	National University of Lesotho
NTU:	Nottingham Trent University
OA:	Open Access
ODeL:	Open and Distance eLearning
ODL:	Open and Distance Learning
PK:	Pedagogical Knowledge
REM:	Research, Evaluation and Media
RSA:	Republic of South Africa
SADC:	South African Development Community
SNS:	Social Networking Sites
STIP:	The Science, Technology and Innovation Policy (STIP)
TAM:	Technology Adoption Model
TELT:	Technology-Enhanced Learning and Teaching
TK:	Technological Knowledge
TPACK:	Technological, Pedagogical, Content Knowledge
UK:	United Kingdom
UKOU:	United Kingdom Open University
UNESCO:	United Nations Educational, Scientific, and Cultural Organization
USF:	The Universal Service Fund
UMTS:	Universal Mobile Telecommunications System
UNISA:	University of South Africa
USA:	United States of America
VCL:	Vodacom Lesotho
VLE:	Virtual Learning Environments
Wi-Fi:	Wireless Fidelity

Glossary of terms

Blended distance learning:	A thoughtful, strategic and systematic fusion of face-to-face, print-based, and online instruction for optimised ODL outcomes.
Blended learning:	A combination of face-to-face and online instruction for optimised learning outcomes.
Collaboration:	Sharing of knowledge, understanding, and responsibilities to co-produce gradable and non-gradable group work/assignments.
Communication:	An exchange of learner-to-learner or learner-to-tutor/facilitator messages and meanings related to the course and its management.
Critical success factors:	Empirically-based/evidence-based factors likely to yield successful and sustainable blended learning pedagogic innovation.
Digital literacy:	Skills required for competent and confident use of ICTs for communication in social, economic, and educational settings.
E-learning:	Learning supported by use of any form of electronic media, online or offline.
Enablers:	Factors that can facilitate blended learning pedagogy within specific contexts.
Engagement:	Effort and persistence invested in accessing and participating in the online activities of the study.
ICT:	Digital technological tools and resources facilitating synchronous (real-time) and asynchronous or "text-based Internet" (Garrison and Kanuka, 2004, p.96)(Garrison & Hakuna, 2004, p.96) worldwide exchange of information. The hardware, software, networks and media storage, processing, transmission and presentation of information (voice, data, text, images), service ().
ICT infrastructure:	Appropriate connectivity infrastructure and international access, a significant density of computers and mobile phones, as well as wider access to sufficient electricity supply (LCA, 2017b, p.24).

Instructional technology:	Web-based technology referred to also as new or digital technology.
Interaction:	An exchange of knowledge and information related to the study between the learners with the aim to promote learning.
IT specialists:	Any employee of NUL serving under the IT administrative and/or academic cadre, holding a relevant position to the study.
Key administrator:	Any administrator within the top NUL management structure with decision-making powers on pedagogic innovation.
Learners:	Any students enrolled in any of the NUL part-time/ODL programmes offered at IEMS.
Long-Term Evolution:	A standard for high-speed wireless communication for mobile terminals, based on the GSM/EDGE and UMTS/HSPA technologies (LCA, 2017).
Online learning:	Synchronous or asynchronous learning which relies completely on use of the internet.
Open and distance learning:	Any formal learning comprising limited or no face-to-face instruction and supported by ICTs and/or other instructional media.
Pedagogy:	Teaching and learning methods and approaches.
Seat time component:	Time spent by learners in a face-to-face traditional classroom setting (Morrison, 2013).
Tutors:	Any teaching and learning facilitator engaged in any of the NUL part-time/ODL programmes on part-time or full-time basis.
Web 2.0 technologies:	ICTs capable to facilitate interactive two-way communication, such as, desktop and laptops computers, tablets, and smartphones.

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Introduction to the Thesis and its Structure

This thesis presents an inquiry of a contextually-relevant pedagogic model of blended distance learning for the National University of Lesotho (NUL). In the first chapter I set out the rationale, the purpose (aim) of this study as well as the research questions that guided the study. In Chapter Two, I provide a critical analysis of the reviewed literature to argue that this subject area is not under-researched only in Lesotho but also in other developing countries. I then present the methodology together with an overview and the rationale for my choice of the research methods and procedures in Chapter Three. This section is followed by the findings of this study in Chapter Four and the analysis and discussion of these findings in Chapter Five. In Chapter Six, I explain how the research aim and objectives of this study were met and how the study contributes to knowledge. The limitations of this study, recommendations at micro, meso and macro scales and final remarks follow. Then, I conclude the chapter with some suggestions for future research.

Abstract

Amid the global enthusiasm for adoption and implementation of blended learning, innovations in higher learning institutions in sub-Saharan Africa and other developing countries are reported as less successful and unsustainable. The identified challenges include, among others, the limited Information and Communication Technology (ICT) infrastructure, inadequate policies, adoption of blended learning models not suited to educational contexts, and innovations that are not aligned to the institutional goals. This action research (AR) adapted Graham, Woodfield and Harrison's (2013) framework for institutional adoption and implementation of blended learning to design and develop a contextually-relevant adoption strategy for Open and Distance Learning programmes of the National University of Lesotho (NUL). Using the qualitative and quantitative research instruments in this parallel convergent mixed methods research design, participants were selected from the key ICT and education stakeholders in Lesotho to explore the existing national and institutional ICT strategy, structure, support and technology experiences of the tutors and learners. The samples respondents were selected at the national level (5), at the secondary schools (3), the members of the NUL Management Team (3), the NUL senior administrators (3), the NUL IT specialists (2), 30 tutors and 209 learners across the three AR research cycles of this study. Given the identified challenges of inadequate ICT strategy, structure, support as well as technology experiences of the tutors and learners, this study concluded that a contextually-relevant blended distance learning model for NUL should comprise face-to-face, print-based and online instruction. The key contributions to the new knowledge derived from this research include an adapted blended learning adoption framework (Graham, Woodfield, and Harrison, 2013) which adds the tutors and learners to the markers of progress in the transition from the traditional pedagogy to a technology-based pedagogy and a methodological approach which incorporates Piggot-Irvine's (2002) spin-off cycles into Elliott's (1991) action research model for a deeper understanding of the researched educational context. The study recommends the ICT and education policy development or review at the national and the institutional levels in Lesotho and other developing countries as well as a further exploration of the frameworks proposed in this study.

CHAPTER ONE: INTRODUCTION

1.0 Introduction to the chapter

This chapter introduces an action research (AR) conducted within three years of Ph.D. study and two years of post-Ph.D. study. The purpose of this study was to develop an evidence-based pedagogic model of blended learning, relevant to the context of the National University of Lesotho (NUL). Drawing on the work of Fullan (2007) and Davis (2018) on the complexity of educational change, this study makes a significant contribution to new knowledge in adapting Graham, Woodfield and Harrison's (2013) framework for institutional adoption and implementation of blended learning in higher education to the context of Open and Distance Learning (ODL) in Lesotho and other developing countries. Not only does the proposed framework respond to the identified need of harmonised national ICT integration frameworks aligned to the policy and current critical ICT opportunities and limitations identified by Kihoza et al., (2016) in the African context but it is also applicable to developed countries. Through dissemination of the new knowledge generated in this study in forums such as local, regional and international conferences, journals and blogs, this research contributes more widely to the field of blended learning.

1.1 Introduction to the study

Amid the challenges of limited Information and Communication Technology (ICT) infrastructure and hardware (Isaacs and Hollow, 2012; Lesotho Communication Authority – LCA, 2017b), the Management of NUL publicised its implicit vision to enhance teaching and learning through the use of technology (Sejanamane, 2014). The purpose of this study is to explore a contextually-relevant and evidence-based pedagogic model of blended learning for existing NUL part-time or Open and Distance Learning (ODL) programmes. Central to this inquiry is an insight to the existing national and institutional ICT infrastructure and hardware, support, and prior technology experience of the tutors and learners to inform the envisioned pedagogic transformation by NUL.

1.2 Rationale for the study

Drawing on the work of Fullan (2007)and Davis (2018) on the complexity of educational change, this study was motivated by my prior knowledge and experience of the study setting both from the perspective of a part-time and ODL learner and later, an academic in the NUL adult learning context. My prior adult distance learning experience includes NUL and two other higher learning institutions in Africa delivering instruction predominantly through a combination of face-to-face and print-based instructionand online instruction in one of these three institutions. In the light of the implicit vision of NUL, my existing adult and distance learning knowledge and lived experience of limited digital literacy and ICT challenges both within NUL and the country (Lesotho), supported by the reviewed literature prompted the need to investigate a contextually relevant pedagogic model of blended learning.

1.3 Background to the Study

The evolution of technology continues to prompt rapid and significant pedagogic changes in higher learning institutions across the globe (Tyagi, 2012; Renau and Pesudo, 2016). Common to contemporary pedagogic innovations is the notion of blended learning described as an “evolving, responsive, and dynamic” educational process with “no singular best model” (Moskal, Dziuban and Hartman, 2013, p.15).

Notwithstanding the varied conceptions of blended learning, Garrison and Kanuka, (2004, p.97) maintainedn that the

> …real test of blended learning is the effective integration of the two main components (face-to-face and Internet technology).

In consensus with scholars such as Blissit (2016), Brown (2016), and Garrison and Vaughan (2011), Sharma (2010, p.1) asserted that the “classic” definition of blended learning is: a combination of face-to-face and online learning. Furthermore, the term ‘online learning’ has been referred to also as “web-based learning” (Sharma, 2010, p.456) or “Internet-based learning” (Tallent-Runnels et al., 2006, p.94). Central to the concept of blended learning, therefore, is the use of the Internet.

While blended learning relies on the use of the Internet, the literature from sub-Saharan Africa and other developing countries identifies ICT challenges which include inadequate national and institutional ICT infrastructure and resources, as well as the policies to support web-based learning (Olulobe et al. 2016). Other identified challenges included the low technology experience of the tutors and learners (Lesotho, 2016a), lack of electricity in some areas (Molony and Molony, 2006; Yates, 2008; Kisanga and Ireson, 2015; Raphael and Mtebe, 2016; Renau, Pesudo and I, 2016) as well as “slow internet connectivity and lack of internet access to students off-campus” (Gyamfi and Gyaase, 2015, p.80). Hence, the prominence of print media in distance learning in least developed countries such as Lesotho (Lephoto, no date), discussed below.

1.4 The context of Lesotho

Lesotho is a developing country entirely landlocked by the Republic of South Africa. It gained independence from Britain in 1966 (Encyclopaedia of the Nations, 2015). According to the World Population Review (2018), the country has a total area of 30,355 sq km and a population of 2,268,032 spread across its urban, peri-urban and rural areas (LCA, 2017b). The majority of this population (about 75%) lives in rural areas (World Population Review, 2018) associated with poverty (The International Fund for Agricultural Development, n.d.). The economic means of Lesotho include livestock and subsistence agriculture, remittances from family members working in South Africa, Southern Africa Customs Union (SACU), royalties for water supply to South Africa, civil service, employment in textile and garment industry and recent growth in diamond mining (Central Intelligence Agency, 2017).

According to the Worldatlas (2018), Lesotho is “the only independent state in the world that lies entirely above 1,400 m (4,593 ft) in elevation” with 80% of the country above 1,800 m (5,906 ft). Thus, the country is commonly divided into 4 ecological zones, namely, lowlands, plateau, foothills, and mountains (Worldatlas, 2018) with most rural areas situated in foothills and remote mountainous areas not easily accessible. An outline of the education system in Lesotho at secondary and higher education levels follows.

1.4.1 Secondary school education in Lesotho

Conventional education system in Lesotho comprises seven years of primary schooling and three to five years of secondary education prior to enrolment in higher education (Lesotho Communications Authority, 2015; Government of Lesotho, 2013a, p.1). The total number of primary schools registered with the Ministry of Education and Training (MOET) in 2014 was 1477, and 339 secondary schools, the majority (77%) of which are situated in rural areas (Lesotho Bureau of Statistics, 2015, p.27). Schools in Lesotho are predominantly owned and managed by the churches, while the Ministry of Education is responsible for the national curriculum and salaries of the teachers (Government of Lesotho; 2017; Government of Lesotho, 2005).

Beyond the independence of Lesotho in 1966, a series of attempts to localise the national secondary school curriculum led to the adoption of Cambridge Overseas School Certificate (COSC) composed of Cambridge General Certificate of Education 'O' Levels, administered by Cambridge University in the United Kingdom (UK) (Raselimo and Mahao, 2015). In line with national educational developments, COSC was replaced by the Lesotho General Certificate of Secondary Education (LGCSE), with the first syllabi introduced in Lesotho schools in January 2013 (Examinations Council of Lesotho, no date-a, p.1).

LGCSE was adapted from the International General Certificate of Secondary Education (IGCSE) model (Examinations Council of Lesotho, 2018) and it is accredited by Cambridge International Examinations (CIE) (Examinations Council of Lesotho, no date-b). According to the Lesotho National Curriculum Development (NCDC) and the

Examinations Council of Lesotho (ECoL) (2018a), the adapted model (LGCSE) was intended to provide an appropriate curriculum to the educational needs of schools in Lesotho and to promote individual recognition of performance in each subject rather than “the group award system” (Lesotho NCDC and ECoL, 2018a, p.3).

With regard to the use of technology, a limited number of secondary schools in Lesotho benefit from externally funded eLearning initiatives. For instance, 10 secondary schools participated in the New Partnership for Africa’s Development (NEPAD) e-Schools Demo Project in 2005 (Isaacs, 2007). In addition, a total of 9 projects aimed to ensure access to telephone, Internet, broadcasting and postal services across the country were co-funded by the Universal Service Fund (USF) and the African Development Bank (AFDB); more of these projects are in the pipeline (LCA, 2017a). The use of technology in secondary schools was therefore neither standardised nor compulsory. An overview of ICT and education in higher education follows.

1.4.2 Higher education in Lesotho

In Lesotho, higher education is defined as “a tertiary level of education that includes all post high school education with a minimum continuous duration of at least two academic years” (Lesotho Council on Higher Education, 2013a, p.3). The country has seven private institutions and eight public institutions (CHE, 2018). Of the 8 public institutions, NUL is the only university. Amid the lack of or inadequacy of explicit national and institutional Information Technologies (IT) and ICT policies in higher education institutions of Lesotho (Isaacs and Hollow, 2012; LCA, 2016b; Lesotho-a LCA, 2017a), the Government of Lesotho aspires to develop a digitally literate “future workforce" (LCA, 2016, p.1). The intended strategies towards developing the future workforce

entail adoption of new Information and Communication Technologies (ICTs) for more flexible programme delivery and upscaling of Open, Distance and e-Learning (ODeL) approaches for potential reduction of unit costs through the achievement of economies of scale (Lesotho Council on Higher Education, 2013a, pp.25-26).

The ICT context of higher education in Lesotho was characterised by differences in the stages of ICT adoption across the institutions and "the undocumented extent of ICT penetration in these institutions" as well as "limited statistics on ICT indicators related to higher education institutions in Lesotho" (LCA, 2016, p.2), inclusive of NUL. Described as the only public-funded autonomous university (CHE, 2013b, p.61), NUL offered a total of 70 programmes (CHE, 2018) to a population of 9,638 in 2016/17 academic year. It is composed of seven faculties running full-time programmes at its Main Campus and two institutes which include the Institute of Extra-Mural Studies (IEMS), offering part time/ODL programmes of some for the faculties at a different campus. Hence, the classification of NUL as a "dual mode institution" (Lephoto, 2006, p.117). The mission of IEMS, is to

bring the University to the people by using the facilities and resources of the University for the education of the adult population and the youth of Lesotho and for their economic, social and cultural development (NUL, 2018).

Jeans and Kay (n.d. p.7) describe this Institute as "the main contributor to lifelong learning provision" in Lesotho. Its aim is to "widen participation in higher education and make learning accessible to those who would not otherwise be able to study at the main campus". The Institute consists of one Non-Formal Education department and three academic departments, namely, Adult Education, Business Management and

Development and Research, Evaluation and Media. These three academic departments offer part-time credit programmes ranging from diploma to masters' degree level and predominantly delivering a combination of face-to-face and print-based instruction (Lephoto, 2006).

Following an initiative of the NUL Computer Science staff who developed an Intranet system/Learning Management System (LMS) "based on the Sakai platform" in 2014, NUL publicised its implicit vision to adopt technology-enhanced teaching and learning; and to transform IEMS to a "full-fledged open and distance learning centre" (Sejanamane, 2014, p.7). The University also launched a Learning Management System (LMS), referred to also as Virtual Learning Environment (VLE) named "Thuto" (*a native word meaning* '*education'*). These ICT developments were re-affirmed by the NUL Vice-Chancellor as he alluded to an ongoing extensive restructuring exercise which mandated IEMS to facilitate delivery of existing full-time programmes of NUL through ODL (Ntsukunyane, 2016).

As with other distance learning programmes within dual-mode institutions or "conventional campus-based universities" (Lentell, 2012, p.23), the ODL programmes offered at IEMS were exposed to the risk of inadequate support. For instance, in consensus with Lephoto (no date), Lefoka and Panda (2012) showed that such ODL institutions in Lesotho lacked support. Lentell (2012, p.23) observed that such problems emanated from "an institutional lack of understanding about distance learning pedagogy and/or a lack of capability to make the necessary institutional changes required to ensure that distance learning works". The implicit educational change by NUL from traditional pedagogy to technology-enhanced pedagogy therefore, required an institutional understanding of distance learning.

While technology-enhanced teaching and learning does not necessarily imply blended learning, it can be argued that the use of technology in teaching and learning was likely to involve the use of the Internet, thus, rendering the envisaged innovation blended learning. Graham, Woodfield and Harrison (2013) provided another useful distinction between technology-enhanced teaching and learning and blended learning by explaining that the latter was characterised by the reduction of face-to-face contact time, while the former did not.

1.5 Statement of the problem

Amid the limitations of national and institutional ICT infrastructure and hardware, inadequate ICT and education policies, low technology uptake or experience, limited access to basic ICT resources by teachers and learners (Lesotho Council on Higher Education, 2013a) and an undocumented use of ICT in higher learning institutions (LCA, 2016b), NUL is undergoing pedagogic transformation of its existing programmes. In particular, IEMS is mandated not only to transform existing pedagogy, but also to transition into a fully-fledged ODL hub of the entire university. This implies integration of technology into programmes aimed for the development of the adult population and youth enrolled with IEMS without evidence of the national and institutional ICT strategies, structures and support (Graham, Woodfield, and Harrison, 2013). In addition, empirical evidence of prior technology experience (Kennedy et al., 2007) of tutors and learners to inform the rethinking of pedagogic design (Beetham and Sharpe,

2007) was lacking. The suggested limitations of ICT strategy and structure, as well as technology experience of the tutors and learners, therefore, exposed NUL to the risk of unsuccessful and unsustainable blended distance learning adoption and implementation associated with developing countries.

1.6 Aim of the study

The aim of this study was to develop an evidence-based pedagogic model of blended distance learning for the context of NUL, informed by existing ICT strategy, structure, support and technology experiences of the tutors and learners.

1.7 Specific objectives of the study

The objectives of the study were to:

Identify existing national and institutional ICT strategies, structures, and support for the envisioned blended distance learning pedagogy by NUL;

Explore prior technology experiences of adult learners and tutors in existing NUL part-time/ODL programmes;

Determine how blended distance learning pedagogy could be adopted and implemented in the context of NUL;

Design a contextually-relevant blended distance learning pedagogic model for NUL.

1.8 Research questions

The study addressed the following Research Questions:

What national and institutional ICT strategies, structures and support are in place for the envisioned blended distance learning pedagogy by NUL?

What prior technology experience do tutors and learners in existing NUL part-time/ODL programmes have?

How can blended distance learning pedagogy be adopted and implemented in the context of NUL?

What pedagogic model of blended distance learning is relevant to the context of NUL?

1.9 Significance of the study

Significance of this study would not be limited to NUL only. In this section, therefore, I discuss the significance of the study to NUL, to Lesotho and to similar contexts; It was also envisioned that the study would contribute new knowledge to the community of learning.

1.9.1 Significance of the study to NUL

This study was intended to feed into ongoing ICT developments at NUL. For instance, it would add to the needed documentation of ICTs and their use (Lesotho-b LCA, 2016) at NUL. In addition, the findings and recommendations of this study would provide the needed evidence to inform broad and specific NUL ICT policies, in particular, the development of a blended distance learning policy.

In addition, through this AR inquiry, I intended to provide the much-needed evidence-based pedagogic resources for IEMS. These would include a blended distance learning adoption framework, an instructional design of an evidence-based contextually-relevant blended distance learning course module as well as training modules for professional development of academics and induction of the learners.

1.9.2 Significance of the study to Lesotho

To the country at large, this study was intended to contribute new and original knowledge to the scarce literature, not only on blended distance learning adoption and implementation but also to the ICT and education context of Lesotho. Knowledge generated by this study will also be applicable, both to in-class and distance learning environments in Lesotho. Specifically, the study addressed a research gap identified by the Lesotho Government on the adoption of "new Information and Communication Technologies (ICTs)" for more flexible programme delivery and upscaling of "open, distance and e-learning (ODeL)" approaches for the potential reduction of unit costs through the achievement of the economies of scale (CHE, 2013a, p.25-26). Consequently, the knowledge created in this study will benefit other local institutions of higher learning in Lesotho, and relevant national policy-making bodies across the education spectrum.

1.9.3 Contribution of the study to the body of knowledge

The contribution of this study to the body of knowledge is the proposal of a comprehensive blended learning adoption framework, adapted from Graham, Woodfield and Harrison (2013). Although their original framework was helpful in addressing institutional policy and implementation, with emphasis on alignment of course objectives to institutional objectives, the framework did not include tutors and learners as the key markers in blended learning pedagogic developments. Following the suggestion made for future research by Graham, Woodfield and Harrison (2013), the tutors and learners were added to the three original markers of transition (i.e.

strategy, structure and support) across three blended learning stages to make a total of five markers.

In addition, the focus of Graham, Woodfield and Harrison's (2013) blended learning adoption framework was on the institutional level and the framework was developed and tested in a developed country (the United States of America (USA)). Drawing on the theories which emphasise the complexity of educational change at different levels (Fullan, 2007; Davis, 2018), this study was original in concurrently testing the adapted framework at two levels (i.e. the national and the institutional level) in a developing country. Thus, contributing to new knowledge on blended learning adoption and implementation.

1.10 Scope

The scope of this AR study is limited to NUL part-time programmes offered at IEMS. This implies the adult learners enrolled in NUL programmes delivered through the ODL mode on the IEMS Campus in 2014-15 and 2015-16 academic years. Part-time and full-time tutors in these programmes during the specified period are also included. Furthermore, in view of the scarcity of the literature on this under researched phenomenon in Lesotho, I involved the key stakeholders in ICT and education within NUL, Lesotho secondary schools and the relevant national bodies to inform the process. A summary of this chapter follows.

1.11 Summary

Influenced by the implicit vision of NUL to adopt eLearning, Chapter One set out this inquiry in order to determine and develop an evidence-based pedagogic model of blended distance learning appropriate to the context of NUL. Despite the scarcity of the literature on ICT and education in Lesotho and identified global and regional challenges to blended learning (commonly defined as a combination of face-to-face and Internet-based learning), critical success factors were also acknowledged. These include blended learning innovations. With the purpose to determine the feasibility of blended distance learning at NUL, the context of NUL part-time/ODL programmes, based on the IEMS campus was explored with emphasis on the existing institutional ICT strategies, structure, support for blended distance learning and prior technology experiences of the tutors and learners. The findings and recommendations of this study will contribute new knowledge on frameworks, policy and practice of eLearning in Lesotho and similar contexts. The next chapter provides a critical review of the literature related to this study.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter provides a critical review of the literature related to the adoption and implementation of blended learning in adult and distance learning contexts. The chapter begins with an overview of the many theoretical and conceptual frameworks that guided this study, followed by the ICT and education context of Lesotho. Definitions of key terms which include *blended learning* and related terms often used synonymously with it, are then analysed critically. These are: *eLearning, online learning* and *distance learning*. Following a critical review of these key terms is a review of the perspectives on other related concepts across local, regional and global perspectives and contexts, as well as perceptions on adult learners and tutors in online learning contexts, blended learning instructional design, perceived challenges to blended learning adoption, critical success factors and enablers of blended learning.

2.1 A theoretical framework of this study

The implicit transition from the existing part-time programmes delivered through traditional ODL instructional mode (face-to-face and print-based instruction) to blended distance learning pedagogy (i.e. an inclusion of Internet-based instruction) at NUL implied educational change. This longitudinal action research was therefore guided by educational change theories which not only emphasise but also address the complexity of change. These were Fullan's (2006) tri-level educational reform model and Davis' (2018) Arena Framework.

Although Davis' (1989) Technology Adoption Model (TAM) which aims to determine Perceived Use (PU)and Perceived Ease of Use (PEU) of technology by potential participants, in this study where little was known about the use of digital technologies, Salmon's (2002) Five-Stage Framework which facilitates induction of participants to the use of technology was more relevant. Nonetheless, TAM factors such as PU and PEU influenced the terminology used in this study. In addition, the model is recommended for future studies not only in this study context, but also in educational contexts where potential participants are more aware of the use of technology.

Furthermore, in this study context where little was known about the use of technology for educational purposes (Isaacs and Hollow, 2012; LCA, 2016; LCA, 2017b), an exploration of the tutors' Technological Pedagogical Content Knowledge (TPACK) (Mishra and Koehler, 2006) and the induction of the tutors and learners to the use of technology guided by Salmon's (2002) Five-Stage Framework were more relevant. This section therefore discusses how these theories and frameworks were applied to this study.

2.1.1 Educational change theories

Central to the theories of educational change or theories of action is the notion of complexity (Fullan, 2006; Fullan, 2007; Davis, 2018). In agreement with Cilliers (1998. p.5), the term 'complexity' cannot be given a simple definition since it "emerges as a result of patterns of interaction between elements", namely, people and resources. For instance, Younie (2006) identified complex connections and inter-dependencies between finance, technology procurement and the levels of resourcing, location and access to ICT within schools and externally imposed curriculum and assessment patterns, which in turn all impacted pedagogical uptake of ICT.

Scholars have cautioned the leaders in education to understand and appreciate the complexity of change (Davis, 2018) if educational developments are to be successful and sustainable. Furthermore, "any strategy of change must simultaneously focus on changing individuals and the culture or system within which they work" (Fullan, 2006, p.7). Thus, educational leaders should embrace holistic rather than simplistic change frameworks which do not recognise or consider interrelationships within a system itself and with other organisations and entities. To this end, a discussion of theories and frameworks aimed to elucidate complexity of educational change from different perspectives follows. These include Fullan’s (2007) tri-level educational reform model, and Davis’ (2018) Arena Framework (Davis, 2018).

i. The tri-level educational reform model

Educational change involves changes in various aspects, facets or elements of an educational system. According to Fullan (2007, p.12), educational change refers to

> changes in various curriculum areas, computers, cooperative learning, special education, school restructuring, teacher education, school-wide innovations, district reform, state and national policies, and so on.

Fullan (2007) went further to identify three critical levels for effective educational reform, referred to as the tri-level, namely, the state or national level, the district level (mid-part) and the school and community level. In consensus with Cilliers' (1998) notion of complexity, Fullan (2007) identified people as elements which interact across these three levels, even though resources were mentioned. For instance, at the national level, there are governments and politicians with the role to push accountability, provide incentives (pressure and support) and also to foster capacity building. At the district level, the identified elements include policymakers and district leaders while the school and community level includes the teacher, the principal, students, parents and the community. *Figure 1* illustrates Fullan's (2007) tri-level reform structure or model.

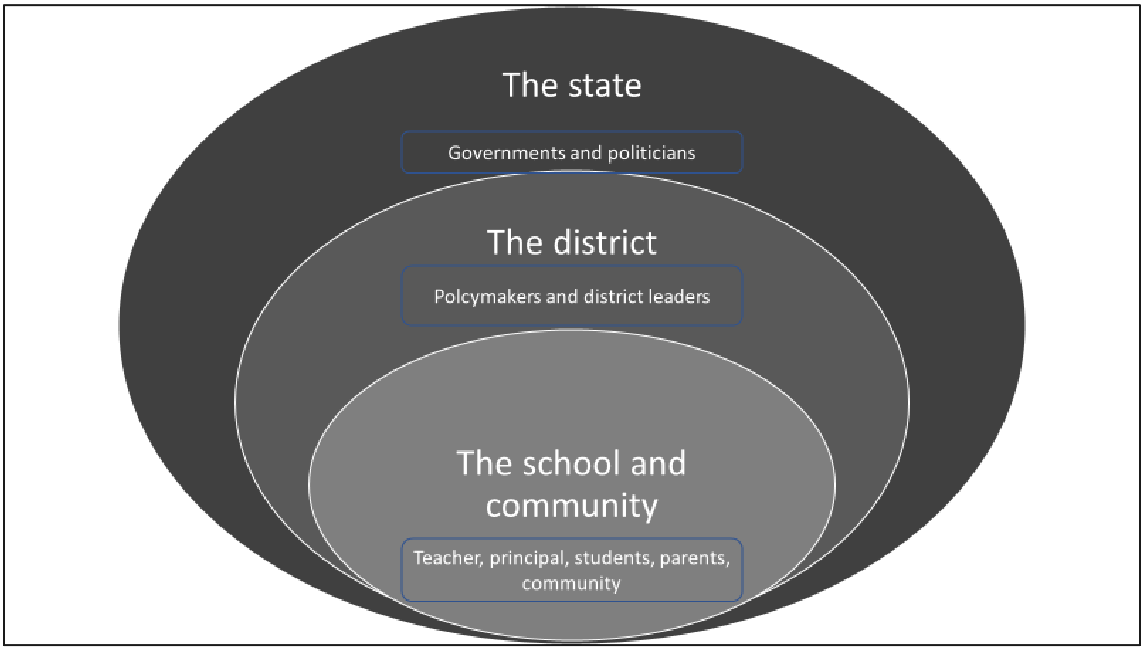

Figure 1: Fullan's (2017) tri-level educational reform model.

Different from Fullan's (2017) model, Davis (2018) introduced the fourth level to the educational change process. The framework is discussed in the next section.

ii. The Arena Framework

Davis (2018, p.10) conceptualised the complexity of educational change from the perspective of ecology, defined as “the study of how living organisms interact with one another and the non-living matter makes up their environment”. In her Arena Framework, Davis (2018) visualised a course within an educational institution (referred to as the central ecosystem), a university (institution of education), a nation (the country) and the world (referred to as the global ecosphere) as components of a community of ecosystems (see Figure 2).

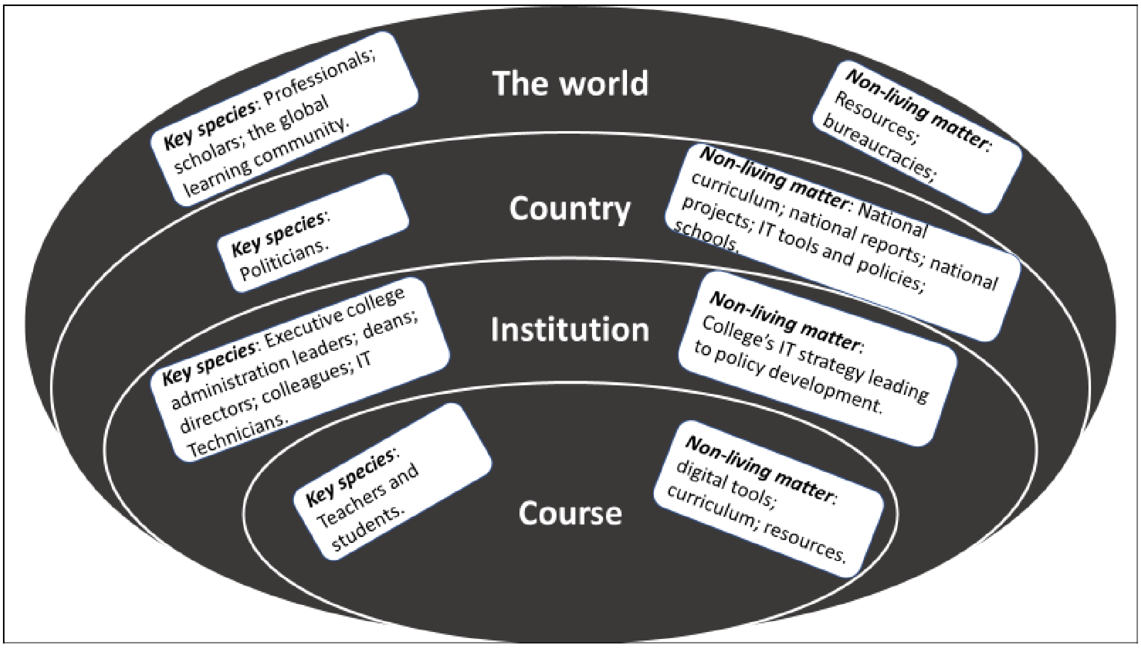

Figure 2: The Arena Framework (adapted from Davis 2018).

As shown in Figure 2, Davis' (2018) Arena Framework not only encompasses interaction, interrelationship and interdependence of key species (living organisms) and non-living matter within each ecosystem but also ecosystems within the global sphere. In this regard, the framework indicates that the complexity of educational change cuts across individual educational systems. Thus, change within individual learning institutions cannot be viewed in isolation from different levels of management or ecosystems both within and outside each organisation.

More importantly, educational institutions such as universities can also be conceptualised as one *ecosystem* containing many *living species* and *nonliving* [sic] matter that encompasses many more course *ecosystems* and administrative *ecosystems* (Davis, 2018, p.12). Although Cilliers' (1998) work could be viewed as dated, the Arena Framework brought up the relevance of both the people and resources as critical elements in analysing the complexity of educational change.

iii. A critical analysis of educational change theories

A critical analysis of educational change theories by Fullan (2006) highlights some of the useful change strategies and identifies strengths and limitations of each strategy as shown in Table 1. Of these suggested strategies, this study that aimed to establish new ways of working and learning collaboratively for enhanced and sustainable development of NUL and Lesotho, was more suited to PLCs.

Although complexity of educational change was understood from the perspective of both the tri-level reform model (Fullan, 2006) and the Arena Framework (Davis, 2018), the latter was more applicable to the context of this study. For instance, central to this study was the course level (i.e. pedagogy) comprising adult distance learners and tutors rather than Fullan's (2006) school and the community composed of students, teachers, the principal, parents and the community. The Arena Framework also advocates inclusion of both the people and available resources to enhance the understanding of the complexity of educational change. Furthermore, given that the focus of this study was on a single university (an institution) within the country, the district level was not relevant. However, the policymakers and leaders within NUL were considered.

Educational change theory	Focus/Components in strategy	Limitations
Standard-based district-wide reform initiatives (SDRIs)	Standards; assessment; curriculum; professional development; and technical support services for school leaders and teachers.	Overlooks the following aspects: conditions for continuous improvement; classroom and school cultures; and instructional practice in the classroom "the black box of instructional practice in the classroom" (Fullan, 2006, p.5).
Professional Learning Communities (PLCs)	New ways of working and learning established through collaboration and commitment to continuous improvement by all; capacity building for sustainable development.	Likely to reinforce autonomy of schools rather than a wider system change.
Qualifications Framework (QF)	Attraction, development and retention of quality teachers and leaders. Best teachers and leaders in schools are assumed to bring about better change to the system.	Focuses on changing individuals to the exclusion of the culture or system within which they work.

Table 1: A comparative analysis of educational change theories adapted from Fullan, 2006.

Notwithstanding the relevance of Davis' Arena Framework to this study, owing to the low technology uptake in Lesotho educational institutions (LCA, 2016a) also evidenced by the dearth of literature, the application of the Arena Framework was limited to the three ecosystems, namely, the course, the institution and the country. Figure 3 illustrates how the two frameworks were contextualised to the exploration of a suitable blended learning pedagogic model for the NUL ODL programmes.

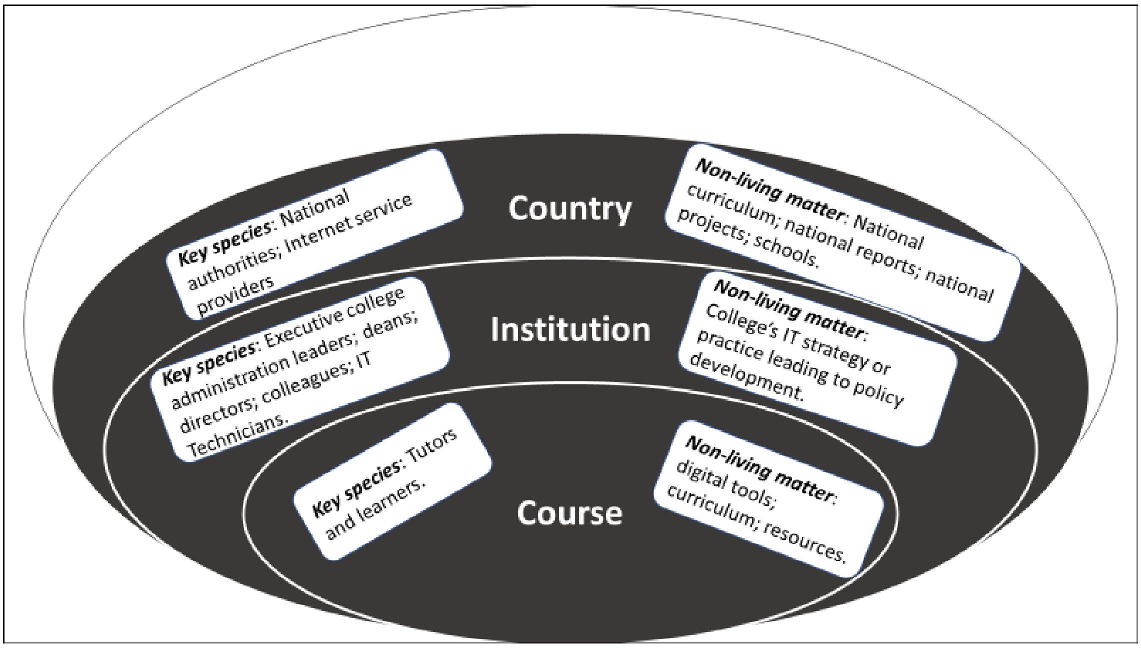

Figure 3: Contextualisation of Davis' (2018) Arena Framework to this study of NUL.

In this regard, this study of the envisioned change by NUL from the traditional part-time or ODL programmes comprising face-to-face and print-based instruction to a blend of face-to-face, print-based, and online instruction entailed an exploration of the course, institutional, and national level.

What sets my approach apart is therefore, the focus on three rather than four ecosystems of Davis' (2018) Arena Framework and the change in key species and non-living matter, as informed by the reviewed literature on ICT and education in Lesotho. This exclusion of the fourth ecosystem (i.e. the world) implies that the professionals, scholars and the global learning community fell outside the scope of this study. A discussion of TAM in relation to this study follows.

2.1.2 Technology Acceptance Model

The envisaged technology-based change at NUL suggests the application of TAM, developed as a doctorate proposal by Davis in 1986. It assumes that attitudes towards technology adoption were influenced by potential users' Perceived Usefulness (PU) and Perceived ease of use (PEU) of computers (Davis, 1989). PU refers to the extent to which potential users believe information technology will enhance their performance while PEU influences "the actual usage of a system" (Davis, 1989, p.320). Hence the author's argument that "an application perceived to be easier to use than another is more likely to be accepted by the users" (Davis, 1989, p.320). Figure 4 illustrates the influence of these two determinants (i.e. PU and PEU) hypothesised as being fundamental to technology acceptance by the users (Davis, 1989).

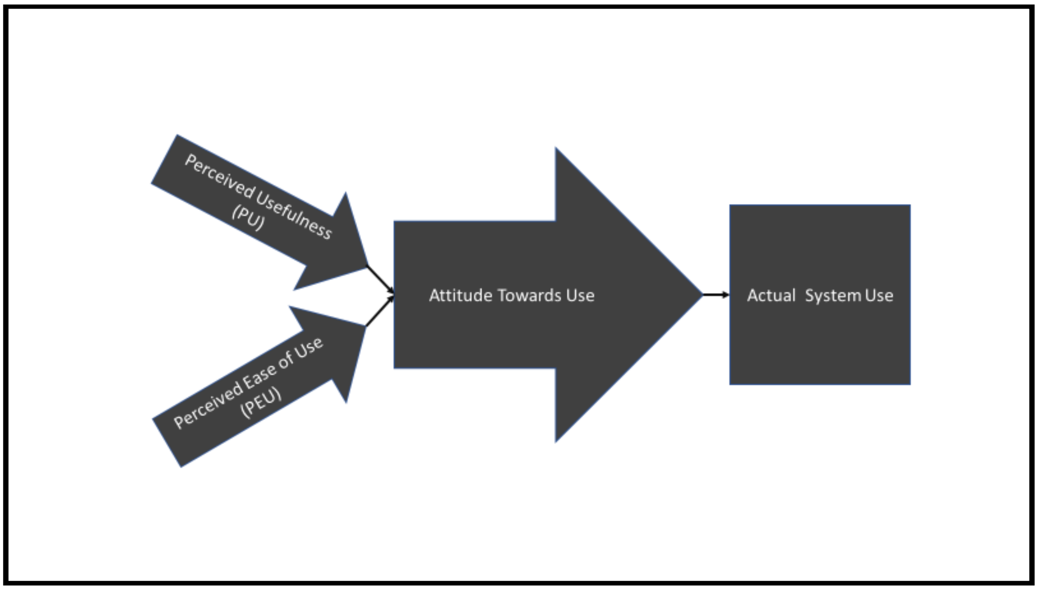

Figure 4: *Davis' (1986) basic Technology Adoption Model.*

Application and review of Davis' (1986) TAM by numerous scholars yielded additional factors to the original two (i.e. PU and PEU). For instance, a review of the TAM by Lai (2017) shows that over the years the model evolved to include among others, *external* *variables* that trigger consideration of the use of technology such as experience and voluntariness, the *intention to use*, *behavioural intention* and *usage behaviour* and prior *experience* of potential users (see Figure 5).

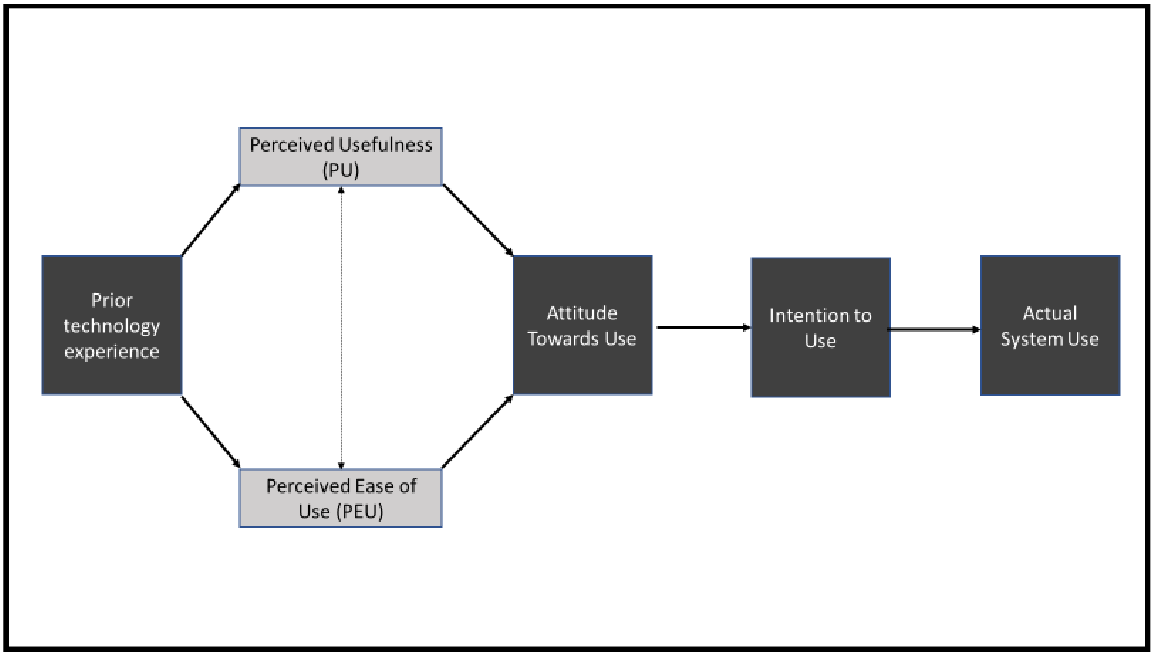

Figure 5: A revised conceptual Technology Acceptance Model (Davis, Bogozzi and Warshaw, 1989).

Drawing on different versions of TAM that have emerged over time (Davis, Bogozzi, Warshaw, 1989; Venkatesh and Davis, 1996; Venkatesh and Davis, 2000; Venkatesh, Morris and Davis, 2003; Venkatesh and Bala, 2008; Lai, 2017; Teeroovengadum, Heeraman and Jugurnath, 2017; Eslamian, A., Rajabion, L., Tofighi, B., Khalili, 2019)), therefore, it can be argued that PU and PEU are influenced by internal and external variables which can impact *attitudes towards use of technology.* The variables include “top management and peer support” and “competencies in using specialized ICT tools” (Teeroovengadum, Heeraman and Jugurnath, 2017, p.4); and more specific, Internet use skills, personal experience and self-confidence (Eslamian, A., Rajabion, L., Tofighi, B., Khalili, 2019).

In addition, although attitudes of potential users might be positive, the factors such as contextual challenges and enablers of the use of technology and prior *technology experience* (Kennedy et al 2007; Thinyane, 2010) could also influence the *intention to use computers*, prior to the *actual system use*. These additional factors were therefore considered in the exploration of a contextually relevant blended learning model for NUL.

Drawing on the foregoing reviewed literature on TAM, the interrelationship between technology experience (prior and new) and the attitudes of tutors and learners were factored into the process of determining the users' technology acceptance. Taking into consideration the influence of each new experience on their 'personal narratives,' (Younie, 2001) derived from experience, beliefs and values.

Notwithstanding the influence of TAM on this study, in view of the limited digital literacy suggested by the reviewed literature (Isaacs and Hollow, 2012), Salmon's (2002) this Five-stage Framework which focuses on induction to online learning to inform technology adoption was deemed more relevant and appropriate to this study. A discussion of this framework follows.

2.1.3 The Five-stage Framework

Salmon's (2002, p.11) Five-stage Framework shown in Figure 6 is described as a "structured learning scaffold" to aid induction and development of online learning competencies. In this framework, the scholar introduced e-tivities, which are perceived as not only “a conceptual framework for discussing interactive learning activities” (Muirhead, 2002, p.1) but also cost-effective “frameworks for enhancing active and participative online learning by individuals and groups” (Salmon, 2002, p.3). For example, according to Salmon (2002), the model only required access to the Internet, text-based and asynchronous discussion boards or forums (Salmon, 2002; Salmon, 2003; Salmon 2005). Given that the model did not require sophisticated technologies which might not be available in the context of Lesotho and the identified factors such as the low economy, low digital literacy of tutors and learners, limited ICT infrastructure and expertise (LCA, 2017b; Isaacs and Hollow, 2012, Yates, 2008) and the absence of the evidence of application of this framework in that context, this study adopted the framework to inform a pedagogically relevant blended learning model.

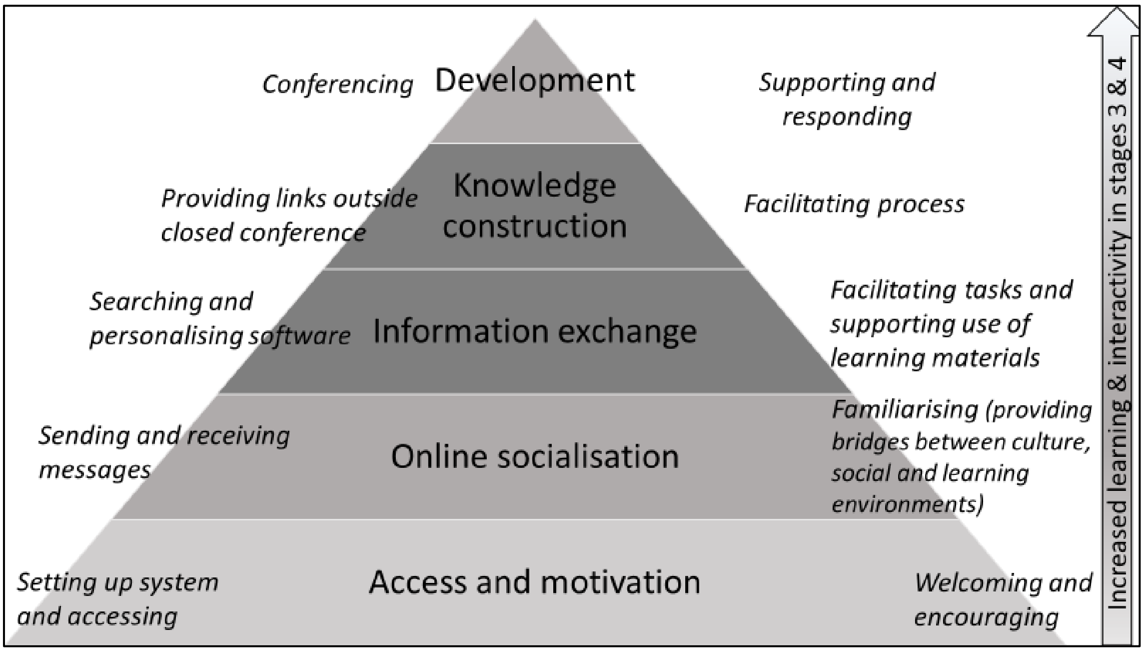

Figure 6: A Framework and E-tivities (adapted from Salmon, 2002).

Salmon’s (2002) Five-stage Framework has been criticised for its focus on facilitation of online networking and group working rather than different individual face-to-face learning situations and styles (Moule, 2007, p.39). Nevertheless, in this study of distance learners and tutors with the need to interact and collaborate online, I perceived this criticism as a strength. Hence, the adoption of the framework. Further to Salmon' (2002) work, Preston (2007) added the sixth stage of development in her theory of braided learning, discussed in the next section.

2.1.4 Braided learning theory

Closely linked to the notion of PLCs (Fullan, 2006) is Preston's (2007) braided learning theory which "addresses the way in which knowledge is jointly constructed through online texts created by and for" fellow Community of Practice (CoP) members. In this context, the author defined CoP as "a human process of working and learning together" with the focus on professionals such as educators, researchers, policy makers, and software developers.

Preston's (2007) braided learning framework draws on Salmon's (2002) Five-stage framework. The main distinction between the two frameworks is that the braided learning theory assumes that professionals are digitally competent as they would have already mastered the first two stages of Salmon's (2002) framework. For instance, the first stage of the five-stage framework concerns online learners' access and motivation to use technology, while the first stage of the braided learning theory involves braided digital exchanges by a CoP. This implies knowledge construction through braided texts (i.e. interwoven comments, judgements and evidence shared within a CoP) aimed to influence current professional thinking; followed by braided artefacts (i.e.

reinterpretation of texts for purposes of sharing with those outside the CoP and, ultimately, influencing and making policy. Preston's (2007) braided learning theory stages therefore begin at stage three of Salmon's (2002) Five-stage Framework (i.e. information exchange). Figure 7 provides a comparison of both frameworks.

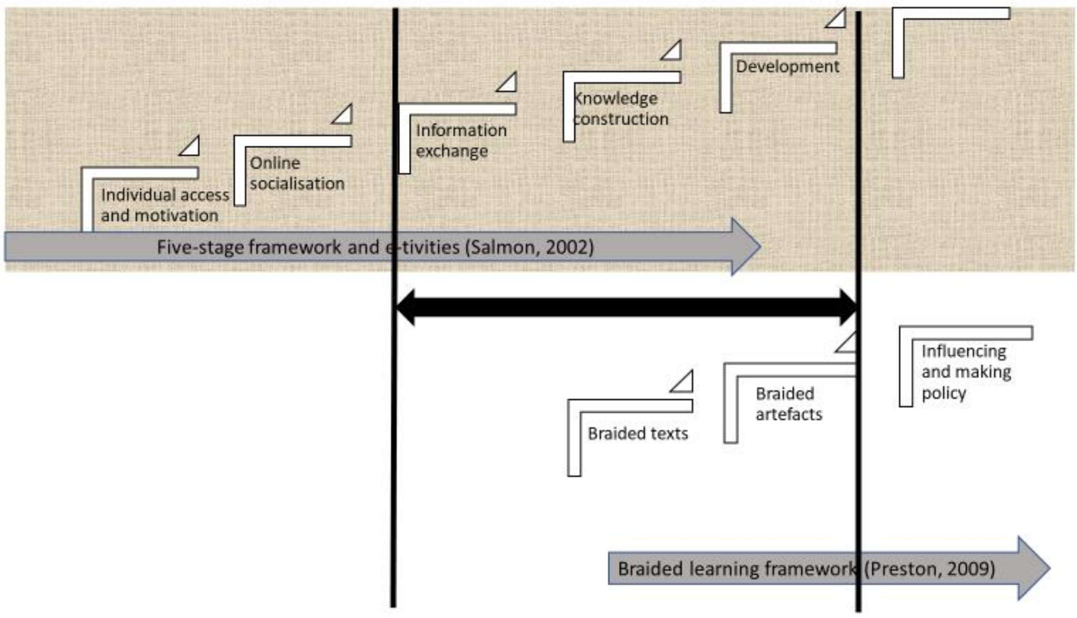

Figure 7: A comparison of Salmon's 5-stage framework and Preston's braided learning concept.

In the context of Lesotho, and in particular NUL, where the tutors were said not to be digitally literate, Salmon's (2002) framework which is concerned with induction to online learning was more relevant to this study. However, with the goal to develop a CoP and influence policy development or reform through joint knowledge construction at different levels (i.e. course, institutional, national, and global), Preston's (2007), braided learning model remained critical to the later stages of this study (i.e. post-Ph.D).

Informed by these two frameworks (see Figure 7), a conceptual framework that guided this study was as illustrated in Figure 8. This adapted framework entailed 6 stages, namely, individual access and motivation, online socialisation, information exchange; knowledge construction; development as well as influencing and making policy.

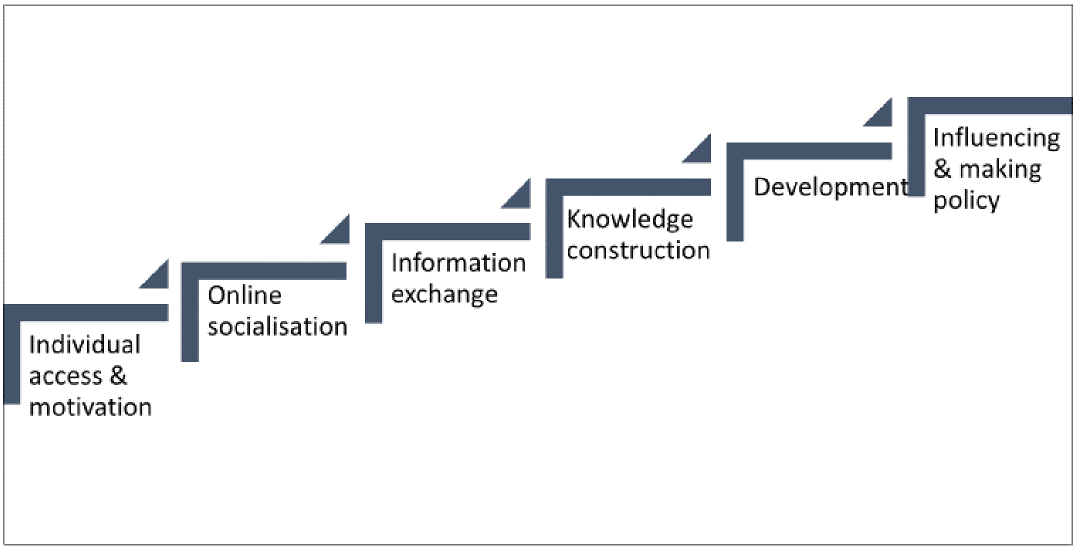

Figure 8: A six-stage framework for blended learning pedagogic innovation adapted from Salmon (2002) and Preston (2007).

The adapted framework (see Figure 8) was more appropriate for this study where tutors and learners in the context of NUL were equally assumed not to be digitally competent enough to begin the process from the first stage of the braided learning model. The tutors were however, expected to develop throughout the stages of this AR to a point where they would contribute towards policy development. In this regard, the Technology, Pedagogy, and Content Knowledge (TPACK) framework, recognised for its potential to enhance understanding and use of technology in teaching and learning, was adopted to inform the anticipated professional development of the tutors in this study. This framework is discussed in the next section.

2.1.5 Technological Pedagogical Content Knowledge

TPACK refers to a complex situated form of teacher knowledge required for technology integration in teaching with the aim to

> develop a nuanced understanding of the complex relationships between technology, content, and pedagogy, and using this understanding to develop appropriate, context-specific strategies and representations (Mishra and Koehler, 2006, p.1029).

The framework is therefore concerned with making connections between the three knowledge domains to help the teachers to understand how the constructs (i.e. technology, pedagogy and content) are interrelated (Koh and Chai, 2014).

TPACK has been derived from the work of Shulman (1986, p.9) which focused on the “complexities of teacher understanding and transmission of content knowledge”. Central to his work were the Content Knowledge (CK) which refers to “the amount and organization of knowledge per se, in the mind of the teacher” and Pedagogical Knowledge (PK) “which goes beyond knowledge of the subject matter per se to the subject matter knowledge for teaching” (Shulman, 1989, p.9). These two knowledge domains or constructs together formed Pedagogical Content Knowledge (PCK) described by the author as a particular form of content knowledge that embodied aspects of teachability. Figure 9 illustrates the interrelationship of these two knowledge domains.

Different from earlier conceptions of Content Knowledge (CK) and Pedagogical Knowledge (PK), TPACK “emphasises connections, interactions, affordances, and constraints between and among” the actual subject matter to be learned and taught (content); the process and practice or methods of teaching and learning (pedagogy), as well as both traditional and new technology (i.e. chalkboards, and digital technologies). Hence, the interrelatedness, interrelationships and interdependence of each knowledge domain on others (see Figure 10).

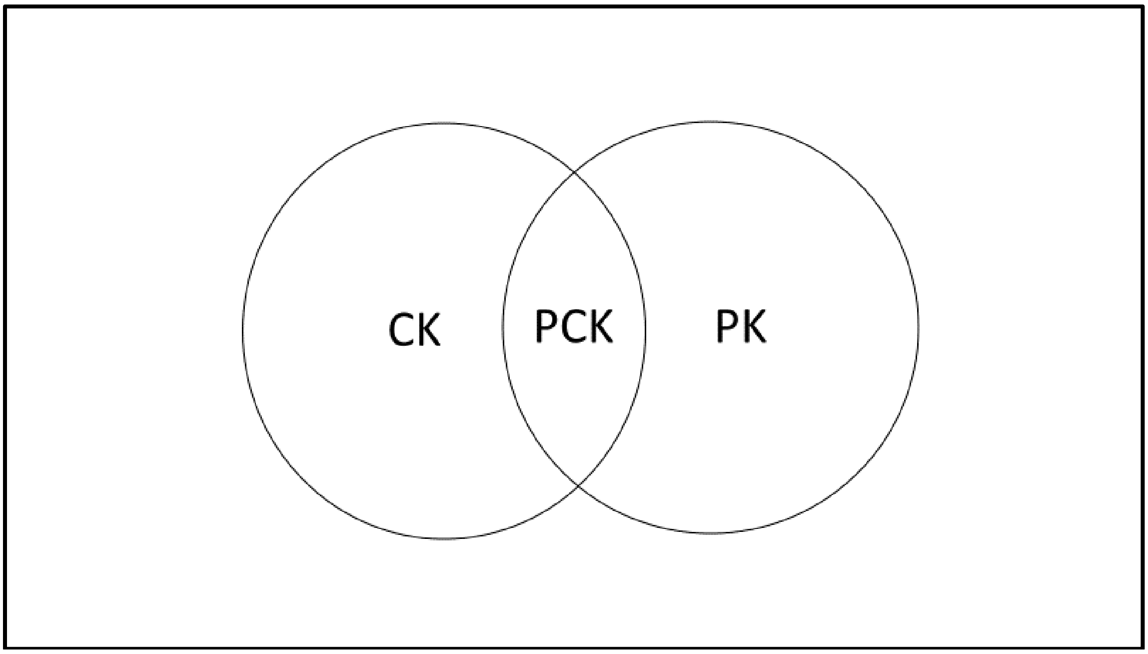

Figure 9: Shulman’s (1986) Pedagogical Content Knowledge (PCK) model.

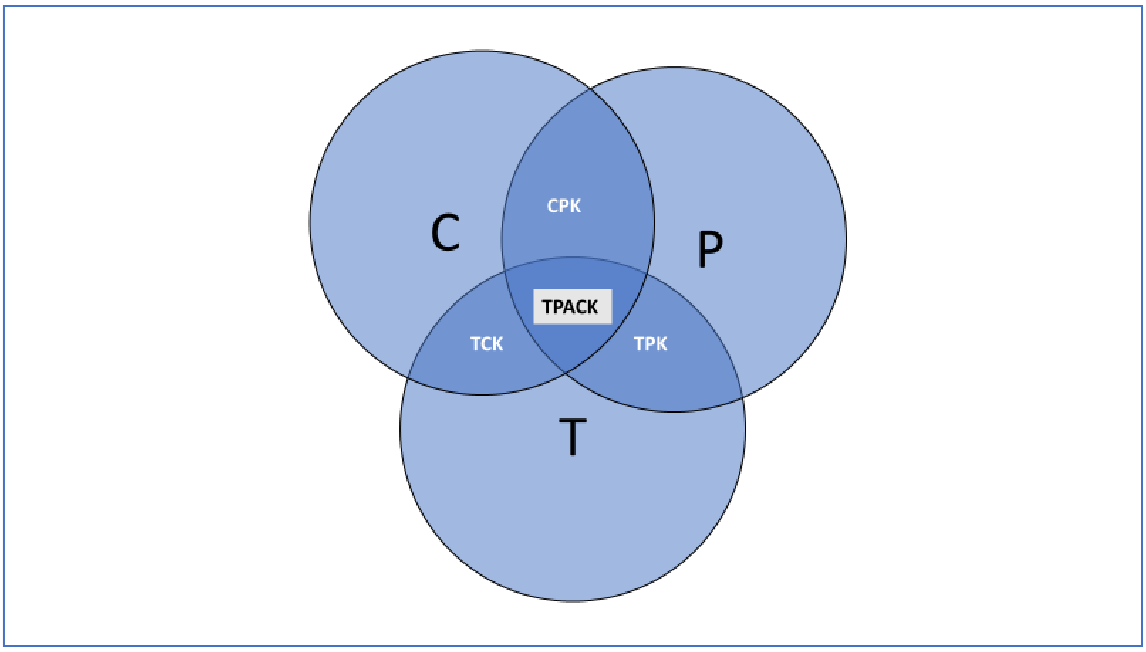

Figure 10: Technological Pedagogical Content Knowledge framework adopted from (Mishra and Koehler, 2006).

Although the model had the potential to provide a strong foundation for future technology integration (Graham, 2011, p.1959), TPACK has been criticised for its lack of comprehensive description of teachers' development (Koh and Chai, 2014), its difficulty in evaluating teachers' TPACK (Yeh et al., 2016), lack of clear definitions of its key constructs and how they relate, clear boundaries in the case of adjacent elements, rationale for essentiality of each domain and how each contributes to enhanced understanding of technology adoption challenges faced by practitioners (Graham, 2011). In this regard, the conclusion by Graham (2011, p.1959) that "considerable theoretical work" needed to be done if the potential of TPACK is to be realised, is still relevant.

Notwithstanding the limitations of TPACK, the framework provides direction towards professional development of tutors, viewed as essential for the successful introduction of new technologies (Graham, Woodfield and Harrison, 2013; Avalos, 2011; Harris et al., 2009; Vescio et al., 2008). For example, over and above technological and pedagogical training (Graham, Woodfield and Harrison, 2013), professional development of tutors should entail TPACKing, described as "the process of constructing knowledge of technology, pedagogy and content for the purpose of teaching in the technology-rich" environments (Olofson, Swallow, and Neumann, 2016, p.198).

Amid the limitations of the TPACK framework, Ifinedo, Saarela and Hamalanen (2019, p.34) asserted that the framework "promotes designing strategies suitable for the teachers' needs". In this regard, these scholars quantitatively examined the TPACK of teacher educators in a developing country (Nigeria) in order to determine their readiness for technology integration. In addition, Kihoza et al. (2016) used aspects of TPACK constructs to assess, among others, technological knowledge of tutors and teacher trainees. Similarly, in the context of this study where a low digital literacy of teachers was reported (Isaacs, 2007a; Isaacs and Hollow, 2012; LCA, 2016b), rather than determine the tutors' understanding of the relationship between TPACK constructs, technological knowledge of tutors was assessed with emphasis on access and skills. A summary of all underpinning theories, frameworks, and approaches employed in this study follows.

2.1.6 Summary of theoretical frameworks applied to this study

Following the envisioned transformation from the existing combination of face-to-face and print-based instruction to include online instruction, this inquiry was guided by existing educational change theories which include Fullan's (2006) tri-level educational reform theory and Davis' (2018) the Arena Framework. These theories evidence the complexity of educational change given the interaction, interrelationship and interdependence between people and resources across the course design level, institution, country, and the world. Underpinning theories also included TAM which highlights the factors that influence technology acceptance, a structured scaffold (Salmon, 2002) for induction of online learners (tutors and learners) leading to policy influencing and development (Salmon, 2002; Preston; 2007) as well as professional development of tutors guided by TPACK (Mishra, Punya., Koehler, 2006). Underpinned by these reviewed theories, the next section presents the conceptual frameworks which guided the study.

2.2 The conceptual Framework of the study

Graham, Woodfield and Harrison (2013) developed a useful framework for institutional adoption and implementation of blended learning in higher education. However, as acknowledged by these authors, course design aspects such as pedagogy, tutors and learners were not included as their categories of interest (i.e. markers and indicators of progress towards blended learning). Hence their suggestion to add tutors and learners as *markers* in further studies (Graham, Woodfield and Harrison, 2013) as in this research.

The framework highlights three stages of transition from traditional teaching and learning methods to a blend of face-to-face and online instruction, namely: *Stage 1 – Awareness and exploration; Stage 2 – Adoption and early implementation; and Stage 3 – Mature implementation and growth*. Common 'markers' across these three stages of transition, each with a set of indicators of progress, are *ICT strategy, structure,* and *support* (see Table 2).

Graham, Woodfield and Harrison's (2013) framework provides a useful tool to monitor and measure the transitional progress in the blended learning adoption. Additionally, the flexibility of the researchers to select or add relevant markers and indicators to their study settings rendered the model applicable to the context of Lesotho. Nonetheless, other than the identified gap or limitation that the framework does not address the course level, the framework was not applied to the national level. In this regard, the adapted framework in this study included both the course level and the institutional level. The tutors and learners to the framework are additional markers.

Drawing on the work of Salmon (2002) and Preston (2007) and central to the course level, was an exploration of prior technology experiences of tutors and learners to inform their induction to online instruction and policy development. Specific to the tutors, constructs of TPACK (Mishra and Koehler, 2006) guided an analysis of their professional development needs.

Category	**Stage 1 - Awareness and Exploration**	**Stage 2 - Adoption and Early implementation**	**Stage 3 - Mature implementation and Growth**
Strategy			
Purpose	Individual faculty and administrators informally identify specific BL benefits	Administrators identify the purposes to motivate institutional adoption of BL	Administrative refinement of purposes for continued promotion and funding of BL
Advocacy	Individual faculty and administrators informally advocate	BL formally approved and advocated by university administrators	Formal BL advocacy by university administrators and departments or colleges
Implemen-tation	Individual faculty members implementing BL	Administrators target implementation in high impact areas and among the willing faculty	Departments or colleges strategically facilitate wide-spread faculty implementation
Definition	No uniform definition of BL proposed	Initial definition of BL formally proposed	Refined definition of BL formally adopted
Policy	No uniform BL policy in place	Tentative policies adopted and communicated to stakeholders, policies revised as needed	Robust policies in place with little need for revision, high level of community awareness
Structure			
Governance	No official approval or implementation system	Emerging structures primarily to regulate and approve BL courses	Robust structures involving academic unit leaders for strategic decision making
Models	No institutional models established	Identifying and exploring BL models	General BL models encouraged, not enforced
Scheduling	No designation of BL courses as such in course registration and catalogue system	Efforts to designate BL courses in registration and catalogue system	BL designations or madality metadata availale in registration and catalog system
Evaluation	No formal evaluations in place addressing BL learning outcomes	Limited institutional evaluations addressing BL learning outcomes	Evaluation data addressing BL learning outcomes systematically reviewed
Support			
Technical	Primary focus on traditional classroom technical support	Increased focus on BL or online technological support for faculty and students	Well-established technological support to address BL or online needs of all stakeholders
Pedagogical	No course development process in place	Experimentation and building of a formal course development process	Robust course development process established and systematically promoted
Incentives	No identified faculty incentive structure for implementation	Exploration of faculty incentive structure for faculty training and course development	Well-established faculty incentive structure for systematic training and implementation

Table 2: Original markers and indicators of transition across the three stages of blended learning proposed by Graham, Woodfield and Harrison (2013).

In view of the complexity of educational change (Fullan, 2007; Davis, 2018), two additional markers were added to Graham, Woodfield and Harrison's (2013) blended learning adoption framework. In addition, the adapted framework was tested at three levels of the Lesotho educational system, namely, the course, the institution (NUL) and the country (national level). This approach which was adopted to enhance alignment of these three levels as recommended in earlier studies (Moskal, Dziuban and Hartman, 2013; Munezero and Bekuta, 2016; Olulobe et al., 2016) was original. Table 3 highlights markers and indicators used across the three levels or ecosystems (Davis, 2018) explored in this study. Figure 11 illustrates a comparison of the original framework with three indicators and the adapted framework in this study with five indicators which include the tutors and learners.

Furthermore, whilst Graham, Woodfield and Harrison's (2013) framework for institutional adoption and implementation of blended learning in higher education was originally developed and tested in a developed country, it is here adapted to the context of a developing country, with added markers and levels. Table 3 shows the markers and indicators for each of the three levels. The next section details the ICT and education context of Lesotho.

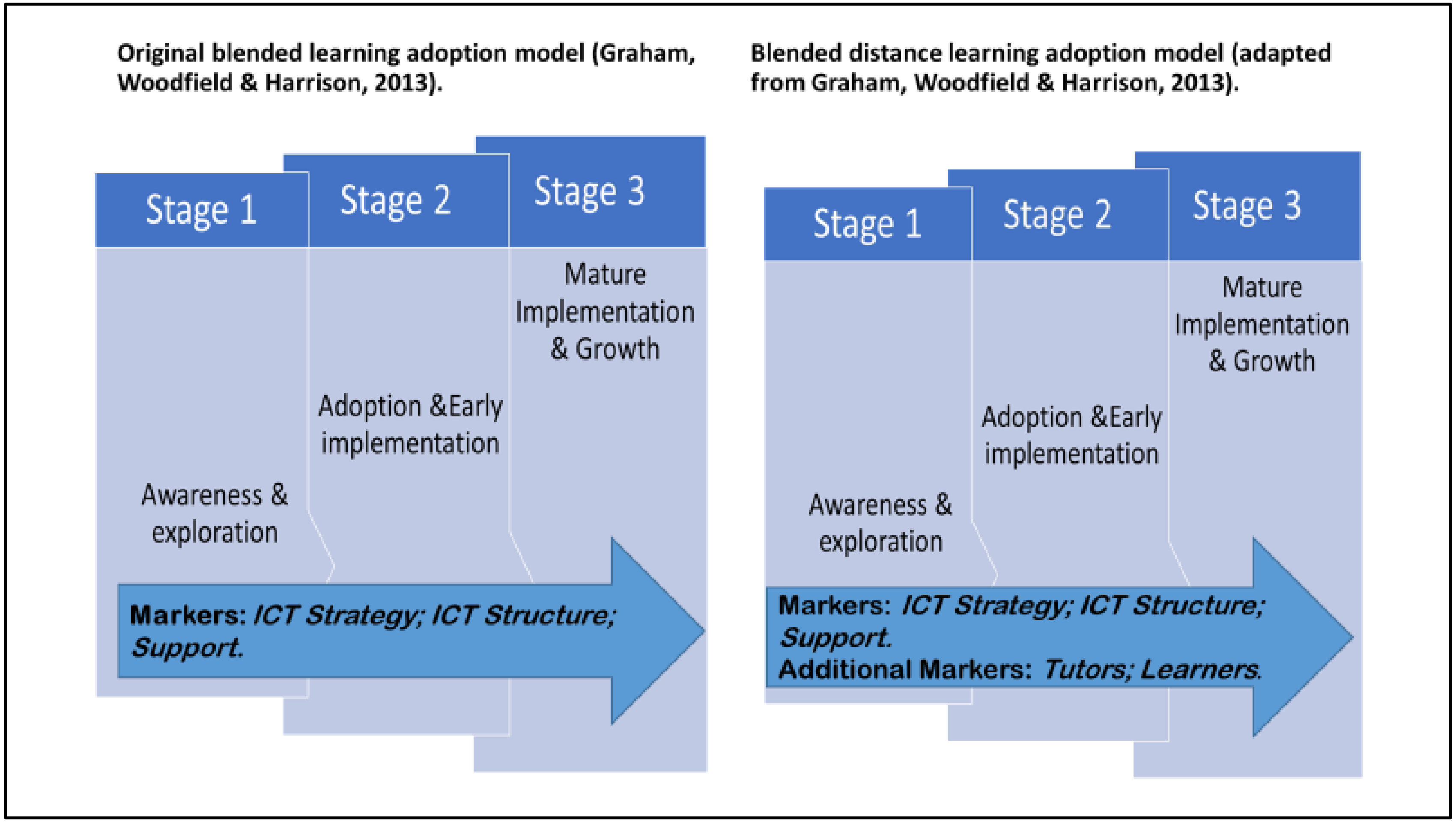

Figure 11: A comparison of Graham, Woodfield and Harrison's (2013) original Blended Learning adoption framework and the version of the framework adapted in this study.

Level/Ecosystem	Markers	Indicators
National	Strategy	National ICT and education policies in Lesotho
	Structure	National ICT infrastructure in Lesotho
	Support	ICT support to educational institutions
Institutional	Strategy	Purpose Advocacy BL definition
	Structure	ICT infrastructure Professional development of tutors
	Support	Technical and pedagogical support for tutors
Course	Faculty/Tutors	Technology access TPACK
	Learners	Technology access Digital literacy

Table 3: Markers and indicators applied across the course, institutional, and national level in the context of Lesotho.

2.3 Background to ICT and education in Lesotho

Over the past decade ICT infrastructure in Lesotho has been improved from the underdeveloped state (Isaacs, 2007) to an "extensive and high" mobile network coverage of "nearly" 96% (LCA, 2017a, p.28). However, according to the LCA (2017b, p.38), despite the extensive 3G and some 4G coverage in Lesotho, not only is the country ranked amongst the lowest levels of broadband penetration as measured by the ITU in terms of the number of active subscribers in the region, but it has by far the lowest use of broadband in terms of intensity.

This low technology uptake was attributable to, among other factors, lack of electricity in 53.4% of households in Lesotho reported from a recent national household survey of ICT in Lesotho with a population sample of 2167 households (LCA, 2017b; LCA, 2016b). Additionally, from the 47% of households with electricity, it was found that their sources of power were the main electricity grid (34.5%); solar (11.3%); generators (0.9%) while 0.1% of the sample connected through a neighbour (LCA, 2017b, p.6).

Other than social and economic statuses of households, the lack of electricity was attributable to the tendency in developing countries to amass physical infrastructure and resources in capital towns (Yates, 2008). Thus, perpetuating the rural-urban digital divide, defined as "the gap between those with regular, effective access to digital technologies, in particular, the Internet, and those without" (Furuholt and Kristiansen, 2007, p.1). Even though the phenomenon has been associated with developing countries such as Lesotho (LCA, 2017a; Yates, 2008; Molony, 2006), the reviewed literature depicted the rural-urban digital divide as a global threat to ICT development. For examples, the phenomenon has been reported in developed countries such as Canada (Hargittai and Hinnant, 2008); the United States of America (USA) (Perrin, 2017) and the United Kingdom (UK) (Jackson, 2017, p.1). However, the affected rural populace in developed countries such as the UK was in the minority (Jackson, 2017).

Amid the global threat posed by the rural-urban digital divide (Jackson, 2017; Perrin, 2017; LCA, 2017a; Yates, 2008; Molony, 2006), statistics of ownership of technologies in Lesotho across the urban, peri-urban, and rural settlements depicted mobile phones as the mostly owned device by Lesotho residents (see Table 4). While these findings increased hope for the envisaged blended distance learning at NUL, despite a sharp increase in ownership of smartphones and tablets by rural American adults, Perrin, (2018) argued that the rural adult was less likely to adopt the use of digital technologies than the non-rural adults who owned multiple devices to access the

Internet. In line with Sustainable Development Goal Four (SGD4), this perception implied a design of an all-inclusive and practical pedagogic model of blended distance learning, initially compatible with the most accessible devices such as smartphones. The model could then be improved gradually, as determined by technology developments in each context.

Type of technology	% of sample	Settlement		
		Urban	Peri-urban	Rural
Owned desktop	11.8	14.1	5.4	4.5
Owned laptop	25.2	27.1	24.7	17.2
Owned tablet/iPad	7.8	7.8	17.4	4.9
Owned mobile phone	78.7	86.9	88.2	72.1

Table 4: Ownership of technologies in Lesotho (adapted from LCA, 2016b).

Although 72% of the rural population sample in the survey owned mobile phones, the rural and remote areas of Lesotho were associated with poverty, lack of electricity and limited ICT infrastructure, products and services (LCA, 2015; Isaacs and Hollow, 2012; Yates, 2008; Molony, 2006). For example, Internet coverage, bandwidth and speed upgrades were more concentrated in urban than rural areas. High-speed Wifi such as LTE (4G) and 21Mbps UMTS/HSPA were predominantly amassed in urban and semi-rural areas by both major Internet service providers in Lesotho while the rural and remote areas representing the larger portion of the country accessed 3G and 2G, with other areas not covered (LCA, 2017a). The majority of Basotho (the citizens of Lesotho) estimated at 75% were therefore exposed to the risk of exclusion (Boulton, 2017) or unequal access to educational opportunities and resources (Chiome, Mupa and Chabaya, 2012; Makoe, 2010).

As with most African countries, Lesotho is a signatory, initially to Millennium Development Goals (MDGs) and, later, to the SDGs (UNESCO, 2017). Specific to the education sector, SDG4 has been recognised as "key to achievement of all other sustainable development goals" (UNESCO, 2017, p.3). SDG4 aims to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all". Target 3 of SDG4 emphasises "equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university by 2030". Inadequate national infrastructure in rural areas implied exclusion of the population from education even if it were only a "sizeable minority" that could not engage in online activity (Jackson, 2017, p.1). Hence, the importance of aligning ICT innovations to the existing ICT infrastructure and hardware as well accessibility and affordability of the needed personal devices for online learning. For example, desktop or laptop computer, smartphone, tablet, home broadband connection, identified as the determinants of digital technology adoption by rural American adults vs non-rural adults (Perrin, 2018).

The reviewed literature on ICT and education in Lesotho also emphasise "lack of digital literacy amongst the teachers, lack of ICT infrastructure in the schools and the need for retraining of teachers" as challenges that led to discussion of ICT and education policy with the Ministry of Education and Training (LCA, 2017a). This statement implied continuation of the lack of explicit collaboration mechanisms between the "Ministry of

Education and other ministries, the private sector and civil society institutions" mentioned by Isaacs (2007, p.9).

The need for professional development of tutors at NUL, if the implicit vision of blended learning were to be realise therefore not be overemphasised. Furthermore; the relatively low mobile broadband penetration (28%) (LCA, 2016b) amid extensive and high mobile network coverage (about 96%) suggested a deeper exploration of the reasons behind this status. More importantly, these challenges identified in the reviewed literature indicated the need to consider existing strategies, structures, and support (Graham, Woodfield and Harrison, 2013) by the Government of Lesotho towards technology adoption in education.

Other major challenges to ICT adoption and implementation in Lesotho, ordered by frequency of occurrence (LCA, 2016b) were:

1) Lack of funding;
2) Delays in buying and/or [sic] replacing ICT equipment;
3) Low bandwidth;
4) Lack of IT/ICT policies;
5) Unreliable network;
6) No Internet access in the area;
7) Astronomical cost of high-speed Internet connectivity;
8) No LEC [sic] power grid in the area.

These identified challenges to some extent signified minimal ICT development in Lesotho in almost a decade. For instance, in 2007, NUL was reported not to have ICT facilities to support teaching and learning for its students (Isaacs, 2007, p.8). Regarding the Internet, the two Internet service providers in Lesotho (ETL and VCL) maintained that high cost of ICT devices and data were "barriers to access and use" of the Internet, despite the 3G and 4G coverage of above 90% (LCA, 2017b, p.27). Thus, suggesting the consideration of Government support towards ICT innovation in educational institutions of Lesotho in terms of Virtual Learning Environments (VLEs) "broadband, bandwidth and access, hardware and software" (Boulton, 2014). While the economies of the countries differed, such support by the Government was likely to encourage the use of technology by educational institutions.

Despite these potential challenges and threats to the envisaged blended learning adoption at NUL, the reviewed literature from the countries in Africa and similar contexts suggested enablers or critical success factors. For instance, Ng'umbi (2013) reported active participation by a learner in a rural and remote village without electricity or a computer. Through the use of only a mobile phone charged on a car battery, the learner responded almost instantly to the researcher's email. Not only did this experience demonstrate feasibility of online learning amid the challenges identified in developing countries similar to Lesotho but it also supported the findings and arguments that:

78.7% of the participants in a national survey of Lesotho owned mobile phones (LCA, 2017b);

The most advanced form of technology is not a viable medium for most ODL learners in developing countries (Ng'umbi and Rwegerela, 2013);

The mobile phone was proven to be one of the possible ways through which the learners could access the Internet (Ng'umbi, 2013);

The rural-urban digital divide in developing countries can be addressed through the use of solar cells to introduce telephones and Internet connectivity in areas still without electricity (Saidu et al, 2012);

Portable computers that use solar energy and are powerful enough to receive the internet and email services from satellite signals even in the remote areas (Mahenge and Nihuka, 2009);

It is only the mobile phone not the PC that can solve the digital divide in most parts of Africa (Furuholt and Kristiansen, 2007).

Smartphones and portable computers therefore had the potential to facilitate web-based learning even in rural and remote areas of Africa and other developing countries. Specific to Lesotho, the national survey conducted by the LCA indicated that 11.8% of the sample residing in urban, peri-urban and rural areas of Lesotho owned desktop computers; 25.2% owned laptops; while 7.8% owned tablets or iPads (LCA, 2017b).

Amid these findings on accessibility to digital technology devices to the citizens of Lesotho, evidence of feasibility of blended distance learning at NUL remained lacking. More importantly, inclusion and equality of Internet access to the learners across the country and beyond, had not been evidenced, hence the relevance of this study to address this critical aspect aligned to SDG4 (i.e. inclusive and equitable quality education and promotion of lifelong learning opportunities for all)."

Other ways to meet the needs of the learners in rural and remote areas associated with low economy and lack of appropriate products and electricity (Molony, 2006) include the use of public access points such as Internet cafes (LCA, 2009; Hargittai and Hinnant, 2008), ICT resource centres in institutions or tele-centres at district and village levels or the use of solar powered portable computers (Mahenge and Nihuka, 2009). Nevertheless, more recent literature on ICT developments in Lesotho showed a decline of 14% (55 to 43) in operational Internet cafes across the country, within a period of 6 months. The decrease was attributed to the adoption of smart phones and computing equipment, the use of generators and solar energy to charge digital devices, proliferation of Wi-Fi hotspots, penetration of mobile broadband, and “extensive and high” mobile network coverage of “nearly 96%” (LCA, 2017a, p.28).

Enabling factors also included the existing strategies and structures, policies and other documented knowledge relevant to ICT and education in Lesotho. These would form the basis for the much-needed empirical data to inform ICT developments in education. For instance, the country has a national ICT policy and body mandated with regulation of Telecommunications, ICTs, Broadcasting, Radio frequency and Postal Services, namely, the LCA and the responsibility to “intervene to correct imbalances or market distortions in favour of users” (Lesotho Ministry of Communications, 2005, p.24). Such structures could mitigate identified common challenges of staff members and students with no access to basic equipment, limited or non-existent institutional intranet services, inadequate internet bandwidth which supports all the users and institutional policies reflecting “limited commitment to effective integration of ICTs in education,” as reported by the Lesotho Council on Higher Education (CHE) (2013a, p.26).

With its mandate to create "affordable packages and schemes under which students, teachers and educational institutions can afford ICT Products and services" (Lesotho Ministry of Communications, 2005, p.30), LCA could address these identified constraints. This could be achieved through collaboration between the Ministry of Education and Training, the Ministry of Communications, Science and Technology, LCA and internet service providers in Lesotho to inform the needed explicit national ICT and education policy sensitive to the needs of the learners, tutors and learning institutions.

The existing ICT Policy for Lesotho recognises the role of the educational institutions as

To play a major role in improving teaching and learning mechanisms that develop a society that is ICT literate and capable of producing local ICT products and services;

To ensure the ICT literacy is part of core curricular;

To use ICTs to expand access to education as well as improving the quality of education.

Consequently, affordability of mobile prices, including the Internet, was a critical enabler of the envisioned ICT literate nation and broadened access to education and training opportunities through the promotion of electronic distance education and virtual learning stated in the national policy, among others. More importantly, the ICT Policy for Lesotho should be reviewed not only to include but also to prioritise digital divide within communities where some users were regarded "more elite" (Furuholt and Kristiansen, 2007, p.12) due to their social and economic status. These perceptions suggest consideration of the factors such as the rural-urban digital divide together with what I termed socio-economic digital-divide, given the poverty associated with about 75% of the Lesotho population residing in rural and remote areas.

Identified challenges related to blended distance learning adoption and implementation (i.e. comprising online/Internet-based learning) in Lesotho could therefore be attributed to deductive themes which include ICT strategies, structures, support (Graham, Woodfield and Harrison, 2013) at both the national and institutional level and the low digital literacy of key stakeholders (such as tutors and learners) in education. Having set out the education and ICT context of Lesotho, the next sections provide an analysis of key concepts related to blended learning, preceded by a discussion of perspectives on blended learning.

2.4 Blended learning perspectives

The notion of blended learning existed within the educational landscape before the advent of digital technologies (Kaur, 2013). In broad terms, the concept refers to a mix of various educational aspects such as the philosophies underpinning the teaching methods and approaches, different modes of delivery and the use of multimedia to maximise the learning outcomes. However, contemporary definitions mostly have limited blended learning to combinations of face-to-face and online learning (Blissit, 2016; Brown, 2016; Garrison and Vaughan, 2011). In a review of definitions of blended learning proposed over a period exceeding “20 years”, Sharma (2010, p.1) concluded that “the classic” description of blended learning was “a combination of face-to-face and online teaching,” as opposed to a blend of technologies or methodologies.

Blended learning has also been defined as a mix of distance learning and traditional onsite learning (Pop, 2016), online and offline instruction and resources (Benson and

Kolsaker, 2015,) synchronous (live or real-time) and asynchronous (delayed delivery and feedback) media (University of South Africa, 2016; Holden and Westfall, 2006; Laster, 2005; Garrison and Kanuna, 2004). Furthermore, in a study of instructors' approaches to blended learning in UK, Benson and Kolsaker (2015, p.316) identified a wide variation manifesting in pedagogic strategies, instructional design and delivery of content. Hence, the conclusion that blended learning is an "evolving, responsive, and dynamic" educational process with "no singular best model" (Moskal, Dziuban and Hartman, 2013, p.15).

In view of the foregoing varied conceptions of blended learning, Fernandes, Costa and Peres (2016, p.4) asserted that the notion of blended learning exists in a continuum of minimal online learning and minimal face-to-face learning and that at institutional level, "transparency and regulation" of blended learning was generally lacking. Nevertheless, in consensus with Garrison and Kanuka (2004), central to the notion of blended learning was a transformative redesign of teaching and learning.

The term blended learning has often been used synonymously with eLearning and online learning. For instance, eLearning has been conceptualised as

Web-based instruction or online learning (Newby et al., 2011, p.217).

Online access to learning resources, anywhere, anytime (Holmes and Gardner, 2006, p.14).

From these cited definitions, it could be assumed that the term eLearning was synonymous with online learning. However, other scholars conceptualised eLearning as an all-embracing term for any teaching and learning activity supported through the use of electronic devices, with no emphasis of online. For instance, eLearning has been defined as:

Instruction delivered on digital devices such as desktop computer, laptop computer, tablet, or smart phone to support learning (Clarke and Mayer, 2016, p.8);

Campus-based learning supported with particular technical media (Peters, 2010, p.83).

Any learning that is electronically mediated or facilitated by transactions software (Tallent-Runnels et al., 2006, p.94);

Acquisition and use of knowledge distributed and facilitated primarily by electronic means (Wentling et al., 2000, p.5).

eLearning can be defined as a comprehensive term for any form of learning supported through any electronic means ‘online’ or ‘off-line’ (Benson and Kolsaker, 2015). Hence, the conclusion that the nature of eLearning is “pervasive and contested” and definitions vary (Beauchamp, 2012, p.2).

In this study, eLearning refers to learning supported by the use of any form of electronic media, online or offline. Thus, blended learning and online learning fall within the scope or a continuum (Bullen, 2014) of eLearning. A further exploration of the distinction and relationship between eLearning, online learning and blended learning follows.

2.5 eLearning, online learning, and blended learning

The term blended learning has often been used synonymously with eLearning and online learning. For instance, Newby et al. (2011, p.217) maintained that web-based instruction is also known as online learning or eLearning; Clarke and Mayer’s (2016, p.8) operational definition of eLearning was limited to “instruction delivered on digital devices” such as desktop computer, laptop computer, tablet, or smart phone to support learning.

Other scholarly definitions depict eLearning as an all-encompassing term for any teaching and learning activity supported through any electronic device. For instance, Tallent-Runnels et al. (2006, p.94) maintain that the concept refers to “any learning that is electronically mediated or facilitated by transactions software” while Wentling et al. (2000, p.5) defined eLearning as “acquisition and use of knowledge distributed and facilitated primarily by electronic means”. These definitions reverberate that, different from eLearning, online learning simply implies complete reliance on the internet (Pop, 2016; Rae, 2007), thus, synonymous with web-based or internet-based learning (Sharma, 2010; Tallent-Runnels et al, 2006, p.94).

While eLearning is defined as a comprehensive term signifying the use of electronic media for teaching and learning purposes, online learning is described as completely dependent of the Internet (Pop, 2016; Rae, 2007). This implies that, the distinguishing feature between eLearning and online learning is absolute reliance of online learning on the Internet, regardless of whether the learning is synchronous or asynchronous.

Online learning, therefore, falls within the scope of eLearning as it entails the use of electronic or digital devices to access the Internet. On the other hand, online learning is a component of blended learning, commonly defined as a blend of face-to-face and online learning (Sharma, 2010). Figure 12 illustrates the scope of eLearning in comparison to traditional face-to-face instruction.

Figure 12: Comparison of face-to-face instruction and eLearning.

As illustrated in Figure 12, eLearning can entail a combination of face-to-face instruction and electronic devices such as desktop or laptop computers with or without the use of the Internet. In the context of this study, therefore, the teaching and learning transactions become online learning only when supported by the use of the Internet or the web. Figure 13, adapted from Bates (2015) and Bullen (2014), depicts “the classic” definition (Sharma, 2010, p.1) of blended learning.

Different from Figure 12 (e-Learning), Figure 13 (blended learning) entails face-to-face and online instruction, implying use of the Internet and separation in space and time from a tutor. Thus, despite the use of laptops, Figure 12 would still not reflect ‘blended learning’ but ‘eLearning’ as the laptops were not connected to the Internet.

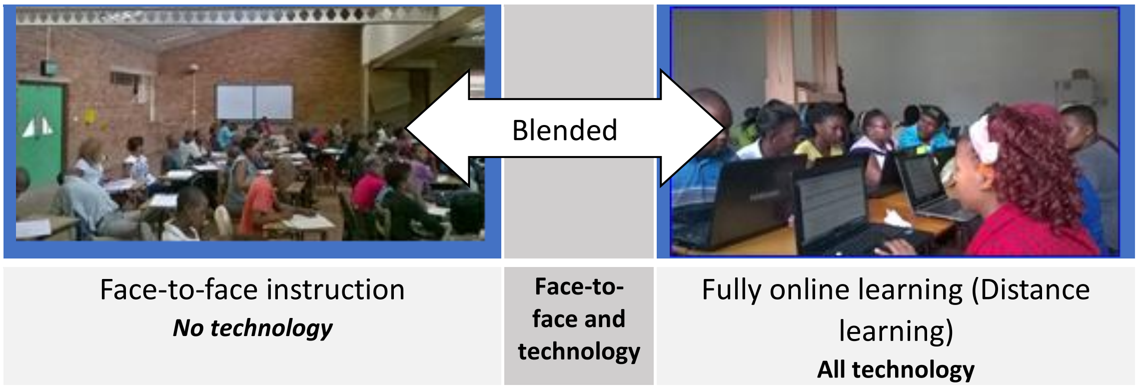

Figure 13: An illustration of the contemporary blended learning concept adapted from Bates (2015) and Bullen (2014).

From the works of Bates (2015) and Bullen (2014), the term ‘distance learning’ and ‘fully online learning’ were used synonymously (see Figure 13). Similarly, Bartolome (2004) defined blended learning as a combination of distance learning and face-to-face teaching, thus, suggesting that the distance learning was synonymous with online learning. Amid the lack of consensus among the practitioners of eLearning, online learning and distance learning (Fernandes, Costa and Peres, 2016), in this study distance learning is different from online learning (i.e. Internet-based learning). A brief analysis of the difference between these two closely linked terms follows.

2.6 A comparative analysis of online learning and distance learning

Fernandes, Costa and Peres (2016) maintained that there was lack of agreement and consistency in definitions of blended learning, online learning and distance learning which led to the interchangeable use of these terms. Nevertheless, Keegan’s (1995, p.10) conception provides a distinction that distance learning was characterised by complete or partial “separation of teacher and learner and of the learner from the learning group”, with the aim to

> free the student from the necessity of travelling to a fixed place (school, college, university) at a fixed time (school timetable, training schedule, lecture programme), to meet a fixed person (teacher, instructor, professor) in order to be trained or educated.

One of the defining features of distance learning, therefore, was separation in physical space and time between the key stakeholders in education (tutors and learners), hence, the increased acceptance of online conferences as a mode of delivery and interaction for professional development processes (Carr, 2016). The author went further to accredit this acceptance and growth of online conferencing to factors such as the changing online conference designs, improved bandwidth, increasing uptake of internet services and, partly, a response to the travel costs, security fears and ecological impacts related to traditional face-to-face conferences.

While the use of the Internet was not a requirement for distance learning, the advent of technology rendered it a useful component, where possible. However, distance learning was in existence long before the advent of digital technology (Keegan, 1995) and continues to exist with or without the use of the Internet, particularly in developing countries.

In agreement with Prensky (2001, p.3) many campuses embrace a “delivery of knowledge through a variety of IT products and processes, including the Internet”. Campus-based (Pop, 2016) learning can therefore “be supported with technical or online media while students and the tutor are in the same building” (Peters, 2010, p.83). In such cases, online learning occurred without any separation in physical space and time. Thus, the learning activity does not reflect distance learning. In this context, I argue that the terms ‘online learning’ or ‘fully online learning’ cannot be used interchangeably with ‘distance learning,’ as they are not synonymous.

Furthermore, in this study, I have adapted the term ‘blended distance learning’ to make a distinction between the distance learning context of this study and “the classic” definition of blended learning (a combination of face-to-face and online learning) applicable to both campus-based and distance learning contexts (Bates, 2015; Bullen; 2014; Peters, 2010; Holden and Westfall, 2006; Bartolome, 2004). Distance learning has been associated with adult learning given its origin aimed, among others, to open learning opportunities to disadvantaged women (Kirkup, 1995). Perspectives on these two concepts that shape the context of this study are examined in the next section.

2.7 Distance learning and adult learning

Distance learning has been recognised as “an excellent method” to reach out to adult learners, offering “the greatest possible control” over the time, place, pace of learning (Falowo, 2007, p.315; Peters, 2010) and the reduced “seat time component” (Moskal, Dziuban and Hartman, 2013, p.20) described as time spent by the learners in face-to-face traditional classrooms (Morrison, 2013). This “high degree of flexibility” (Falowo, 2007, p.315) is perceived as necessary to accommodate adult learners’ competing priorities of work, home and school (Braimoh and Osiki, 2009).

In the context of higher education in Lesotho, distance learning was aimed to respond to the requirements of “working adults who require additional qualifications”, including those who lived far away from higher learning institutions (Lephoto, 2006, pp.119 –

120). Furthermore, two main dual mode institutions of higher learning in Lesotho (i.e. delivering programmes through both full time and partial ODL mode) were NUL and the Lesotho College of Education (LCE). Distance learning programmes were delivered predominantly through a combination of face-to- face and print media to enable adult learners to “attend classes during specified weekends or after working hours (Lephoto 2006, p.120).

Common to adult education practice were the assumptions and principles coined by Knowles (1980) which include that adults learn because of a need to fulfil or a goal to achieve (goal-oriented learning). As a result, adults were perceived as “self-directed beings ... with a growing reservoir of experience that becomes an increasingly rich resource for learning” (Knowles, 1980, p.45). Hence, the notion of “andragogy” referred to as “the art and science of helping adults to learn”, as opposed to “pedagogy”, traditionally understood as “leading” or teaching children through “fact-laden lectures, drill, quizzes and rote memorizing” (Knowles, 1980, pp.40-43) among others.

Central to andragogy was the concept of facilitation of learning, rather than teaching students. This implied involving the learners in instructional design ad content best suited to their “context and learning needs” and engaging them fully through the “presence of all their senses and all their being” rather than physical presence in the room (Rimanoczy, 2016, pp.13-14). Hence, the relevance of constructivism to adult learning through participatory teaching and learning methods to maximise interactivity and collaboration.

With time, the contemporary meaning of pedagogy “lost its exclusive reference to childhood while retaining the original sense of leading or guiding to learn” (Beetham and Sharpe, 2007, p.1). The term “andragogy” also became controversial and the dichotomy of the terms became blurred to a point where Knowles (the main proponent of andragogy) concluded that the terms were better viewed as the two ends of a spectrum and that their underpinning assumptions can be used alongside each other (Knowles, 1980; Davenport, 2013). It is therefore insignificant in this study to draw distinctions between the two terms, especially in this digital age that has ushered in a shift from a teaching to a learning paradigm, rendering online instructors facilitators of learning rather than conveyors of information (Boling et al., 2012, p.118).

In the light of the suggested co-existence of pedagogy and andragogy, in this study, the former refers to teaching and learning methods and approaches. However, this study is underpinned by the principles of andragogy since it is conducted in an adult learning setting. Hence, the adoption of andragogic terminology used interchangeably with familiar pedagogic terminology to the wider learning community. For example, key terms such as ‘facilitator’ with connotations of facilitating learning, as opposed to teaching students. Nevertheless, this andragogic term has been used interchangeably with the terms such as ‘instructor’, ‘tutor’ and ‘teacher’. The term ‘learner’ is used synonymously with ‘student’ where I deemed it appropriate. Owing to the varying concepts of distance learning within contexts and practices, the next section discusses distance learning from the perspective of Lesotho.

2.8 Distance learning in Lesotho

Although the majority of sub-Saharan African countries acknowledge the benefits of distance learning, major problems are the lack of expertise in the practice of ODL models and lack of documentation (Onwe, Way and Lagos, 2013). The scarcity of literature on distance learning in Lesotho to inform this study evidenced this reality. Lesotho, formerly a “colony under British protection” that became independent in 1966 (UNESCO Commission, p.1), embraces the conventional education system (Government of Lesotho, 2005).

In response to the educational needs of the citizens demonstrated by enrolment in the Republic of South Africa (RSA) colleges, the Government of Lesotho established Lesotho Distance Teaching Centre (LDTC) in 1974 (Lefoka and Panda, 2012; Maiaene and Malefane, 1998). The objective of this Centre was, among others, to support private secondary school students through correspondence courses (print-based media), radio programmes (electronic media) and face-to-face tutorial support. From the outset, therefore, distance education at primary and secondary education in Lesotho, offered predominantly by LDTC, comprised a blend of print, electronic, and face-to-face instruction.

At the higher education level, IEMS is recognised as the pioneer of “distance, part-time, part face-to-face” instruction (Lephoto, 2006, p.119). The Institute was founded in 1960 with a mission to educate the adult population of Lesotho (IEMS, 1986, p. 4) through non-formal programmes. Over time, credit programmes were gradually introduced, beginning with certificate, diploma, bachelor’s and masters’ degree levels.

As with most distance learning programmes in dual-mode institutions such as NUL, the Institute experienced inadequate support evidenced by, among others, a "… decrease in financial support, especially from the government … and lack of initiatives and efficiency in resource mobilisation and efficient resource deployment" (Lefoka and Panda, 2012, p.19). For instance, print media became "the predominant" mode of delivery in the part-time and ODL programmes of Lesotho as it was not feasible to reach the possible participants living in rural areas without electricity supply (Lephoto, 2006, p.124). These assertions brought potential implications of the historical insufficiency of the national physical infrastructure in Lesotho to the fore.

Inadequate physical infrastructure rendered a combination of face-to-face and print-based instruction (Lephoto, 2006, p.120) the most appropriate distance learning pedagogy from primary to higher education. Otherwise, the majority (about 75%) of Basotho (citizens of Lesotho) would be at the risk of exclusion from education. In addition, more recent literature on ICT infrastructure in Lesotho still alluded to unequal distribution of Internet services in terms of coverage and quality (LCA, 2017). For instance, there were still areas without access to 3G and 4G. In this regard, distance learning in the context of Lesotho was more likely to retain print-based instruction along with distinct features such as limited face-to-face instruction, and separation in space and time (Mishra, 2010; COL, 2000; Keegan, 1995; Kirkup, 1995). Thus, strengthening my argument that online learning or fully online learning were not synonymous with distance education.

2.9 Blended distance learning in adult learning contexts

The notion of blended distance learning connotes a combination of delivery modes aimed to provide "the greatest possible control" (Falowo, 2007, p.315) over the time, place, pace and path of learning (Bates, 2015). According to Morrison (2013) one of the critical elements of blended learning is reduced seat time, described as reduction of time spent by learners in face-to-face traditional classrooms, with a view to:

Enhanced management of instructional facilities and resources, and increased student enrolments per semester;

The convenience and flexibility associated with online learning to free up time for work, family obligations or extra-curricular activities for the benefit of students;

Development of a skill set for students that otherwise would not be possible in exclusive face-to-face instruction. Skills include digital citizenship, information management skills, self-directed learning and web research and collaboration skills.

Historically, the benefits such as flexibility have been associated with distance learners presumed to

have left school for quite some time, have differential-age levels, married and encumbered with both work and family problems. With the obvious background from which the DLS [distance learners] are coming, therefore, adjusting easily to the rigours of academic activities and especially educational research may not be easy… (Osiki, 2009, p.49).

Along with this perceived background of distance learners, technology affordances have introduced the need to adjust to new concepts such as online learning. Of the components of the proposed new pedagogy in this study, online learning was the most important since it constituted a new phenomenon. The following section focuses on online learning within the scope of adult and distance learning: critical pedagogical aspects such as online learning, adult and distance learners, tutors and instructional technology are therefore examined.

2.9.1 Adult learners and online learning

Earlier studies on the use of technology in education were criticised for focusing more on skills required by teachers to integrate technology into classrooms, than students' learning needs (Harris et al., 2009). However, recent studies have considered perceptions, attitudes and consequent behaviour of the learners in various educational environments and at different levels, ranging from primary schools to higher education (Gyamfi-Gyaase, 2015; Westerman, Daniel and Bowman, 2015; Lopez-Perez, 2011). Although the reviewed literature in this study cuts across the entire education spectrum, the focus of this study has been more on higher learning in adult learning, and distance learning environments.

According to Merriam and Bierma (2013, p.191), the Internet access was beneficial to adults in terms of facilitating “just-in-time, relevant, and self-directed” learning while also providing “overwhelming, inaccurate and misguided” information. Hence, the need for a careful consideration of how online learning adoption would change and challenge the learners and tutors. This would not only be to inform the envisaged new pedagogy but also to develop evidence-based contextually relevant strategies to support these key stakeholders.

Similar to Lesotho, motivation for online learning (Internet-based learning) adoption in USA was mostly attributed to age, income, education (Merriam and Bierma, 2013; LCA, 2017c) and attitudes influenced by cognitive, affective and social needs (Hashim, Tan and Rashid, 2015). Given the assumption that adult learners were goal-oriented and need-focused (Knowles, 1980), it could be expected that individual goals and needs of the adult learners enrolled with NUL would influence supportive attitudes towards blended distance learning.

Furthermore, contrary to earlier perceptions that adult learners were a "substantial and growing group, attracting less attention" Coleman and Furnborough (2010, p.14) and Monru (2011, p.117) reported that "student-worker phenomenon has gained most attention" in Australia, UK and the USA. In this context, student-workers, referred to also as non-traditional university students and "the new student", including "many from disadvantaged backgrounds and those who do not conform to the conventional idea" of university student, were perceived as

> a much more diverse cohort consisting of large numbers of full-fee-paying international students, older, mature-age students studying mainly on a part-time basis by distance education (Monru, 2011, p.115).

In addition, Merriam and Bierema (2013, p.195) maintained that online learning across adult learning and higher education settings was "exploding". The Learners in this study were predominantly working adults, likely to fit Monru's (2011) description of the 'new student'. Thus, challenging NUL to intensify its efforts to meet the technology-related demands of the learners and tutors.

Prensky (2001, p.1) depicted teachers in the conventional education system, who were mainly adults, as "Digital Immigrants … with very little appreciation" of digital skills "acquired and perfected through years of interaction and practice" by students (Prensky, 2001, p.4). However, in this study of adult learners in a higher education institution in Africa with low statistics of Internet users (INTEL, 2012), learners could best be classified as "Digital Immigrants" rather than "Digital Natives".

Furthermore, in contrast to the ideas of Prensky (2001), studies of technology experience of first year university students in Australia (Kennedy, 2007) and South Africa (Thinyane, 2010) rejected the notion of digital natives. The findings of these studies showed that the use of Web 2.0 technology in higher learning institutions of Australia (Kennedy, 2007, p.517) was "quite low". A similar study conducted in a South African university with a sample comprising citizens of Lesotho, the learners seemed "not to use … and not to be interested in using" Web 2.0 technology in their learning (Thinyane, 2010, p.406). From these findings, therefore, there was a possibility that age was not necessarily a determinant of digital literacy, especially in contexts such as Lesotho. The Key determinants identified in the reviewed literature include the attitudes of the learners and tutors.

Informed by prior technology experience and general perceptions on ICT use in education, the attitudes of the learners were considered some of the most crucial factors to success of technology-enhanced innovations (Nihuka and Ngimi, 2013). These could either be supportive or unsupportive attitudes. For instance, in a study by Galanouli et al. (2001), resistance of the learners to ICT adoption was not necessarily based on prior technology experience but the argument that traditional pedagogy had long been in existence and effective. As a result, the learners maintained that there was no need for the change of pedagogy. In addition, the learners who were assumed supportive to ICT innovations showed that their participation was involuntary. They cooperated out of the feelings of compulsion generated by implicit or explicit institutional policies. In that case, therefore, ICT adoption was likely to be unsuccessful or unsustainable due to unsupportive attitudes of the learners. In view of the scarce literature on the attitudes of the learners towards technology integration, and presumably low technology experience, perceptions of the NUL part-time/ODL learners were explored in all the cycles of this AR.

Enthusiasm of the learners (Olulobe et al. 2016) reported in earlier studies was another enabler of “more flexible and creative learning opportunities” (Boulton, 2017, p.80) explored in this study. In particular, the prospect of the learners in higher education to support their learning with Social Networking Sites (SNS) and enthusiasm to adopt the use of Web 2.0 and similar technologies in schools (Raspopovic et al., 2017). Nevertheless, these aspects were more applicable to the learners in countries where explicit ICT and education policies not only existed, but were also implemented (Boulton, 2009).

While not much research was done regarding the use of SNS in Lesotho, lack of explicit national and institutional ICT and education policies, structures and support (LCA, 2017; Isaacs and Hollow, 2012) could be an indication of “rhetoric recognition of importance” Boitshwarelo (2009, p.15) of Web 2.0 technologies. Thus, it is a potential threat to the enthusiasm of the learners. Closely related to the perceptions of the learners in the digital era were those of the tutors, discussed in the next section.

2.9.2 Perceptions of the tutors in higher learning ODL institutions in the digital age

One of the distinguishing features of ODL is its heavy reliance on the services of part-time tutors to reach out to the wider population. Historic key roles played by this "silent force" (Watters et al., 1998, p.250) in the UK Open University (UKOU), for instance, include mediation and support of teaching designed by UKOU course teams, guidance of students' independent learning; assessment of students' work, and provision of "educational advice and support" (Donovan, 2005, p.249). Contact with the learners was mainly through "correspondence tuition." The duties of the part-time tutors included individual learner-support through telephone, letter, email, computer-conferencing system as well as face-to-face group tutorial sessions (Donoval et al., 2005). Part-time tutors therefore need to have access to the learners and vice versa. An overview of the benefits and challenges of engaging part-time lecturers, also referred to also "adjuncts", in higher learning institutions (as adapted from Moorehead, Russell and Pula, 2015, p.102) is presented in Table 5.

Benefits	Challenges
Cutting costs of employing full-time faculty.	Limited participation or involvement in institutional activities.
Flexibility of institutions to adapt quickly to varying enrolment demands.	Lowered quality of instruction. Part-time Lecturers were perceived as more likely to give higher grades because their positions depend on good student evaluations.
Diverse and specialized skills of instructors often working full-time within their field of study. Thus, bringing with them up-to-date, real-world experience and skills.	Poor terms of employment weaken ability to foster excellence and to become genuinely involved with students.
Part-time tutors could also be recent graduates with fresh ideas.	Large number of students being taught by adjuncts risked quality of instruction.

Table 5: Benefits and challenges of engaging part-time tutors in higher learning institutions.

Despite the critical role played by part-time tutors, particularly towards success and sustainability of ODL programmes in institutions such as NUL, “neglect” of this “large” group in higher education (Hopkins, 1989, p.3) has been reported. Although limited participation of part-time tutors in institutional activities was viewed as a challenge to higher learning institutions, according to Hopkins (1989), the tutors cited their lack of involvement by higher learning institutions as an indicator of their being neglected. This could suggest a communication gap between these two parties to be further explored. For instance, management of higher learning institutions could refrain from involving part-time tutors based on their assumptions or reasons best known to them, while the tutors could have been available, hence, the feeling of exclusion.

Identified concerns of part-time tutors include the patronizing attitudes of full-timers (Moorehead, Russell, and Pula, 2015, p.105), less attention to their specific training needs which were different from those of full-time staff (Merriam and Bierma, 2013), less financial dependence on higher learning institutions, which affected their level of commitment as well as their needs and interests (Hopkins, 1989), hence, the feeling of “visitors to the kingdom,” derived from statements of part-time tutors in a study by Watters et al. (1998, p.250). This feeling was attributed to the absence of collegiality and equality with full-time staff, a sense of powerlessness and marginalisation in the institution, lack of support, lack of access to physical facilities, very little recognition of their teaching skills, relevant experience and, generally, no sense of being valued. This literature alluded to the inclusion of both full-time and part-time tutors in this investigation of pedagogy in higher learning settings.

As with other dual-mode institutions of higher learning comprising full-time and part-time tutors and learners, NUL relies heavily on part-time lecturers for success and sustainability of its existing part-time or ODL programmes on the IEMS campus. For instance, in 2014/15 academic year the ratio of full-time to part-time tutors was 1:10 (i.e. 16 full-time to 155 part-time tutors). However, the scarcity of the literature on part-time lecturers indicated that not much was known about their training needs, interests, and feelings. While the focus of this study was not necessarily on part-time lecturers, their participation in this study was therefore crucial. Hence, the operational definition of the term ‘tutor’ to refer to both full-time and part-time academics. Nevertheless, I drew distinctions between these two categories of academics by referring to them as either full-time or part-time for clarity, where necessary. For instance, in a discussion of access to institutional digital technologies, full-time and part-time tutors might not be at par. In this regard, a clear distinction would be necessary.

From the early 2000, ICT skills of the learners have been considered “increasingly more advanced” than those of the tutors. (Galanouli et al., 2001, p.400) and some tutors were said to prefer traditional teaching methods (Roblyer et al. 2010). Such preferences could be attributable to the attitudes informed by their own “personal narratives” (Younie, 2001, p.165) emanating from their experiences. Similarly, the exposure of the tutors to a new experience of technology affordances was likely to influence their personal narratives and to yield positive attitudes.

Galanouli et al. (2001) went further to link the attitudes of the tutors to those of the learners in postulating that positive attitudes of the tutors motivated the learners to use ICT on their own initiative, despite the lack of practical pedagogic support from the tutors. On the other hand, motivated learners tended to help the tutors on how to use ICT. Positive attitudes of both tutors and learners were therefore critical (Galanouli et al. 2001; Younie, 2001; Nihuka and Ngimi 2013; Hashim, Tan and Rashid, 2015) for the adoption of a successful blended learning. The next section addresses common challenges to digital technology adoption in developing countries.

Although the attitudes were considered to be some of the significant determinants of the tutors' behavioural intention to use instructional technology (Al-Busaidi et al. 2016; Cigdem and Topcu, 2015), the attitudes could be more of an end-result of other determinants proposed in Davis' (1989) Technology Acceptance Model. For instance, other significant determinants of the tutors' behavioural intention to use instructional technology were: perceived usefulness, perceived ease of use, technological complexity, subjective norm and application self-efficacy, teachers' pedagogical beliefs and the perceived effectiveness of designed software (Al-Busaidi et al. 2016; Gyamfi, 2016; Cigdem and Topcu, 2015). Such determinants could, in turn, influence the tutors' attitudes.

Kihoza et al. (2016, p.121) purported that "embracing positive attitude will motivate the use of ICT effectively and further upgrade the needed skills." aI In consensus with Mbete (2015), the scholars observed that it was not only the ICT infrastructure such as LMS that was needed for effective, successful, and sustainable blended learning innovation "but also the personal skills, knowledge and competencies in order to use ICT," hence, the recommended strategies for positive behavioural intention of instructors and successful blended learning uptake which include:

- Collaboration between educational authorities and software developers; official integration of such pedagogical software; … improved environmental factors, e.g. computer labs; sufficient access to the tutors and learners (Al-Busaidi et al. 2016, p.153);

- Instructors' support services, and recruitment of instructional designers to bridge the gap between technical and pedagogical support (Raphael and Mtebe, 2016).

Visible and effective leadership involvement in the use of the technology for teaching and learning purposes (Gyamfi, 2016);

- Exposure of instructors to use of technology (Cigdem and Topcu, 2015);

- Convincing policy makers of "the value of integrating ICT into the curriculum" (Leask and Younie, 2001b, p.170).

These recommended measures suggested that the measures reinforce the notion of new technology experience to enable new attitudes. Support for the tutors is also central to the development of positive attitudes needed for behavioural intention to use technology, including "… 'just in time' learning support by informal networks, e.g. family, friends, colleagues in schools…" (Leask and Younie, 2001b, p.165). Furthermore, the recommended strategies for successful blended learning or ICT integration underscore the need for collaborative knowledge construction and involvement of stakeholders to align educational objectives across course design, institutional and national levels (Goodfellow and Lea, 2013; Graham, Woodfield and Harrison, 2013; Moskal, Dziuban and Hartman 2013). Perceptions on collaboration in pedagogic developments are presented in the next section.

2.10 Blended learning instructional design

Critical educational change, including instructional design or redesign, required "a collaborative approach involving the broader community" (Livingston et al, 2017, p.12). This implied an all-inclusive and collaborative approach to raise awareness to technology affordances for informed decisions of stakeholders regarding the need or value of blended distance learning. I therefore perceived the involvement of the tutors and learners (the learning community) important to facilitate collaborative knowledge construction of existing or available ICT infrastructure, digital literacy and access (availability and affordability) of the Internet to the tutors and learners, both on and off the IEMS campus.

Branch and Kopcha (2014, p. 77) defined instructional design as "an iterative process of planning outcomes, selecting effective strategies for teaching and learning, choosing relevant technologies, identifying educational media and measuring performance". The concept of teaching and learning technologies is not new. For instance, basic technologies such as "papyrus and paper, chalk and print, overhead projectors, educational toys and television" have long been in existence (Beetham and Sharpe, 2007, p.4). However, the web evolution continues to provide opportunities for enhanced learning outcomes through digital technologies such as personal mobile and wireless devices which provide "seamless, location-independent access to information services" (Beetham and Sharpe, 2007).

In consensus with Merriam and Bierma (2013) that Web 2.0 technologies facilitate meaningful learning to adults, a study by Boling et al. (2012, p.120) showed that adult learners found text-based, individualised learning with limited interaction less helpful than learning that was more interactive and incorporating the use of multimedia.

Furthermore, different from traditional methodology described as "teacher-control-teacher-centred", modern methodology is student-centred and the role of the tutors is to "help the learners to process learning by encouraging, involving, and helping them to try out and explore" (Karanezi, 2014, p.1568). Hence, the value of the use of Web 2.0 technologies in teaching and learning to enhance critical pedagogic aspects such as online learning and engagement (Cydis, 2015), individual and collective generation of content by the users and sharing of knowledge (through interactive two-way communication), content creation and modification, as well as "support to collaborative and collective intelligence" (Choudhury, 2014, p.8097).

As indicated by Forest (2016), the instructional design process invariably necessitates consideration of the following core components:

1) Assessment of the overall curriculum requirements
2) Analysis of the background knowledge and instructional needs of the learners
3) Defining the overall course objectives
4) Determining the sequential order in which objectives will be addressed
5) Performing evaluations of the course (formative and summative).

These core components suggest that a redesign of pedagogy must entail some or all of the following:

Minimal or total course or programme redesign (Bates, 2015);
Restructuring and replacement of traditional face-to-face contact hours (Garrison and Vaughan, 2008);
Fundamental rethinking of "the course design to optimize student engagement" (Garrison and Vaughan, 2008, p.6)
Location of new technologies "within proven practices and models of teaching" (Beetham and Sharpe, 2007, p.3).
Flexible approaches aligned to the unique pedagogical characteristics of face-to-face teaching (Bates and Poole, 2003).

Furthermore, as opposed to “off-the-shelf” strategies (Hamel and Valikangas, 2003) or “traditional market-led” eLearning approaches, Salmon (2005) proposed an adoption framework that matched internal factors (e.g. resources and skills) and external factors (i.e. opportunities and risks). Influenced by these perceptions, an analysis of Strengths, Weaknesses, Opportunities and Threats (SWOT) was conducted in this study to inform pedagogy redesign. In addition, suggested strategies, measures, procedures and processes for effective instructional design or redesign process identified in the reviewed literature included the following:

Initial restructuring (redesign) should have minimal impact on existing pedagogy, be gradually intensified, and aligned to ICT contexts (Bullen, 2014). For instance, gradual replacement of face-to-face elements (reduction of contact time), and a combination of online learning with small group face-to-face interaction.

Instructional design process must entail identification of distinctive or valued pedagogical aspects of face-to-face instruction that can be replaced or enhanced through technology, and forethought about explicit roles of tutors and learners (Bates, 2015). Hence the relevance of ‘intentional design’ to blended learning (Beetham and Sharpe, 2007; Bullen, 2015; Mainella, 2017) influenced by among others, sensitivity to, and learning from contextual factors (Mainella, 2017) and culture-bound ways of learning and teaching.

Professional development of tutors to foster selection and implementation of appropriate instructional technology (Yeh et al., 2016) for specific pedagogy and content. Hence, the relevance of TPACK framework (Koehler and Mishra, 2009).

Central to instructional design, therefore, were alignment of new pedagogy to existing teaching practice, processes, and methods as well as the ICT context of Lesotho. These were explored through an analysis of Strengths, Weaknesses, Opportunities, and Threats (SWOT) of the existing pedagogy to inform the envisaged pedagogy. In addition, with a view to enhancement of student engagement, I considered technology experience of tutors and learners pertinent to the SWOT analysis.

The andragogic approach (associated with adult learning) adopted in this AR, rendered student engagement defined as “the student’s psychological investment in, and effort directed toward, learning, understanding or mastering the knowledge, skills, and crafts that academic work is intended to promote” (Newmann, 1992, p.12) critical. According to Croates (2007, p.136) “knowledge of student engagement characteristics” can develop pedagogical approaches to enhance involvement of all students, including “those students reporting more passive styles of engagement”. Such passiveness could be attributable to the shyness or reluctance of the students to take the risk of public failure (Graham et al., 2007, p.236).

Turner et al. (2014, p.1201) argued that students were “more engaged when they feel related to others, competent, autonomous and when academic learning is valued and meaningful”. Instructional design must therefore aim to enhance connectedness, competence and autonomy of learning. With regard to digital instructional design, the importance of appropriate technologies to heighten these critical aspects (connectedness, competence, and autonomy) cannot be overemphasised.

Although student engagement is manifested in various ways, the reviewed literature identified two dimensions of student engagement which were important at the stage of induction of the participants to instructional technologies. These were behavioural engagement and emotional engagement (Trowler, 2010, p.5) described as follows:

Behavioural engagement: students who are behaviourally engaged would typically comply with norms, such as attendance and involvement, and would demonstrate absence of disruptive or negative behaviour.

Emotional engagement: students who engage emotionally would experience affective reactions such as interest, enjoyment, or a sense of belonging.

Furthermore, Turner et al. (2014, p.1197) suggested the following indicators of these dimensions of student engagement:

Behavioural engagement: Effort and persistence directed towards learning, understanding or mastering knowledge and skills;

Emotional engagement: Expressions of interest and positive affect.

These perspectives on student engagement signified that the effort and persistence demonstrated by attendance, involvement and absence of negative behaviour of the learners could be the indicators of behavioural engagement. Similarly, statements and actions suggesting interest, enjoyment or a sense of belonging would not indicate only an emotional engagement of the learners in this study but would also indicate supportive attitudes towards the use of technology.

2.11 Blended learning adoption challenges in African countries

Although the African context was characterised by "shifting disparities in infrastructure, skills and experience (Carr, 2016, p.81), a study of universities in more than 10 African countries concluded that ICT-enhanced teaching and learning was predominantly perceived as "a means to an end – to provide better teaching and learning" (Isaacs and Hollow, 2012, p.14). However, enthusiasm, eagerness and passion for IT in some African countries was reported to be "thwarted" by insufficiency in critical IT policies, inadequate ICT infrastructure, funding deficit and lack of essential ICT services, among others (Olulobe et al., 2016, p.4). In this regard, Kihoza et al. (2016) emphasised the urgency of harmonised national ICT integration frameworks aligned to the current critical ICT opportunities and limitations.

Mutanga (2010) explained that ICT integration strategies include policy and planning, financial support for ICT use, improved ICT infrastructure, training in ICT skills and competencies (for teachers and learners) as well as identification and use of appropriate technology and media. Different from the UK, therefore, the absence of the policies in most African countries implied lack of frameworks for ICT integration (Yusuf, 2005), likely to contribute to the low digital literacy reported in Lesotho (LCA, 2017; LCA, 2016; Isaacs and Hollow, 2012).

In some African countries where some policies exist, they are said to be either inadequate (Olulobe et al., 2016) or placing “little emphasis on integration and infusion of ICT in the country’s education system” (Yusuf, 2005, p.316). Lack of frameworks to guide ICT integration could only continue “to demoralize the use of ICT in education” (Kihoza et al, 2016, p.121) due to the factors such as lack of resources, inadequate support for effective integration of technology, inadequate time and lack of rewards for the tutors who were early adopters of digital technology (Merriam, Laura and Bierema, 2013; Graham, Woodfield, and Harrison, 2013; Galanouli et al. 2001).

Other ICT challenges in sub-Saharan Africa and other developing countries included “lack of access to computers, unsustainable power supply, lack of readiness to use ICTs among key users and lack of Internet connectivity” (Kihoza et al., 2016, p.121); the “usage, personnel, deficit in funding and essential services” (Olulobe et al., 2016, p4);

inadequate and unequal distribution of ICT infrastructure and resources across the countries (Raphael and Mbete, 2016; Renau and Pesudo, 2016; Kisanga and Ireson, 2015; Yates, 2008) as well as the "slow internet connectivity and lack of internet access to students off-campus" (Gyamfi and Gyaase, 2015, p.80). ICT challenges in African contexts which include Lesotho were therefore attributable to insufficient internal resources and skills, external environment and underexplored opportunities for ICT use in education (Salmon, 2005). In addition, low commitment and support by governments form part of the internal, external, as well as cultural factors (Ng'ambi et al., 2016) contributing to the low and slow technology uptake.

In a study involving universities in more than 10 African countries, Isaacs and Hollow (2012, p.20) came up with the following comprehensive list of common constraints arranged in hierarchical order:

Limited bandwidth
Lack of financial resources
Inadequate human resource capacity
Limited electricity
Lack of appropriate training
Lack of appropriate hardware
Lack of trained teachers
Lack of appropriate software
Lack of political will
Corruption and theft of resources
Lack of good quality content
Pressure of poverty
Sustainability is not prioritised
Poor leadership
Instability and lack of security

To a great extent, these constraints covered most identified challenges in sub-Saharan Africa or developing countries. However, the impact of each factor differed from country to country in intensity (Isaacs and Hollow, 2012). For instance, while a 'limited bandwidth' was reported in countries such as Zambia and Kenya, it was the most significant constraint in Zambia, but not in Kenya. The most significant constraint in Kenya was 'lack of appropriate training'. These findings therefore resonate with arguments for contextualised blended learning innovations (Olulobe et al. 2016; Moskal, Dziuban and Hartman, 2013; Salmon, 2005).

A study by Younie (2006) demonstrated the complexity of ICT implementation even in developing countries such as the UK, where national ICT and education policies existed. For instance, the study identified five key problematic areas which impacted the institutional level as (1) insufficient leadership and ICT expertise across the multiple agencies, (2) disparities of funding, leading to (3) differing levels of ICT provision, (4) unequal quality of ICT training and (5) the limited impact on pedagogy. Closer to the context of Lesotho, low uptake of digital technology in higher education institutions of South Africa has been attributed to the poor infrastructure, top-down and deterministic institutional implementation, organisational cultures defined by a low recognition of excellence in teaching and learning, lacking incentives for innovation in teaching and learning, poor institutional leadership, low digital literacy among students and staff and prevailing social attitudes toward technology (Gachago et al., 2017, p.14).

2.12 Critical success factors in blended learning adoption

The recommended strategies for success of effective and sustainable adoption and implementation of blended learning innovations globally include increased government prioritisation and support for ICT, policy development and review, as well as monitoring and evaluation of ICT developments (Olulobe et al., 2016; Boulton, 2014; Isaacs and Hollow, 2012). Similarly, such measures could facilitate achievement of SDGs for which Lesotho is a signatory. Scholars have also emphasised the importance of policy implementation by governments. Younie (2006, p.385) identified five problematic key areas in government policy implementation as "management, funding, technology procurement, ICT training and impact on pedagogy". These are relevant for Lesotho; I therefore argue that the Government of Lesotho should address these key areas, not only to facilitate blended learning adoption but also to facilitate the achievement of SDG4.

Furthermore, regardless of ICT-related challenges to pedagogic innovations in Lesotho and other developing countries, scholars have shown that contextually-sensitive adoption and implementation of blended learning models could yield effective and sustainable solutions, hence the recommendations for innovations (Munezero and Bekuta, 2016) that "play out within the culture and climate of each institution" and also link course design (pedagogic goals) to institutional goals (Moskal, Dziuban and Hartman, 2013, p.20; Goodfellow and Lea, 2013; Graham, Woodfield and Harrison, 2013).

In addition, Moskal, Dziuban, and Hartman (2013, p.16) recommended a strong institutional leadership to facilitate alignment of "the goals of both administrators and faculty … if a blended learning initiative is to succeed". For instance, the leadership role comprised aspects such as effective planning, coordination and communication of beneficial academic and technical and administrative functions across all sub-systems (Mushi, 2009). The proposition that innovations introduced at only one level of the education system were not likely to succeed (Haymore-Sandholtz, Ringstaff, and Dwyer, 1992), therefore, remained relevant. A collaborative and all-inclusive approach aimed to align course design level to the institutional level (NUL) involving the learners, tutors, key administrators, IT specialists and the NUL Management Team was adopted in this study.

A study of eLearning involving institutions in more than 10 countries depicted "access to appropriate content for ICT-enhanced learning and training" as the most influential factor (Isaacs and Hollow, 2012, p.22) in adoption of eLearning. The identified factors arranged in order of importance by these authors were as follows:

Access to appropriate content for ICT-enhanced learning and training.
Infrastructure for ICT-enhanced learning and training: electricity, buildings, broadband.
Professional development and training for ICT-enhanced learning and training.
Access to affordable and reliable computers.
Research on ICT-enhanced learning and training.
ICT-enhanced learning and training in rural regions.
Learning outcomes from ICT-enhanced learning and training.
Sustainability of ICT-enhanced learning and training.
The growth of mobile learning.
Multi-stakeholder partnerships.
Impact assessment.
Monitoring and evaluation.
Scalability.
Social media.
Profitability

Access to teaching and learning resources were therefore a priority and key motivation to technology adoption in African institutions of higher learning. Access has also been considered a key factor for effective development of digital literacy (Salmon, 2002). The importance of access to design and implementation of pedagogic models that entail the use of digital technologies can therefore not be overlooked. This includes access to ICT resources (digital devices and the Internet) as well as access to online learning resources and material. In this regard, access was one of the embedded themes in this study conducted in the context with an identified need of “modern and efficient infrastructure” to deliver computing and information services such as the Internet, mobile cellular communications and distance learning among others (Government of Lesotho, 2005, p.26). Furthermore, little was known in this context about accessibility of digital technologies and the Internet to the tutors and learners.

An evaluative study of an externally funded eLearning project involving 10 polytechnics and one public university in Ghana (Africa) depicted the daily practice and ICT support to faculty and learners as a critical success factor (Bon, 2010). ICT strategies to be developed by the Government of Lesotho and in particular, NUL, must entail explicit support structures and mechanisms accessible to all the key stakeholders (full-time and part-time tutors and learners) if the envisioned blended learning developments were to succeed. Closely linked to critical success factors for blended learning adoption were the enablers or facilitators of ICT use in higher learning. These are discussed in the next section.

2.13 Enablers of ICT use in the learning institutions in developing countries

In this study, enablers refer to factors that could facilitate blended learning pedagogy within specific contexts while critical success factors refer to those that have been empirically proven to yield successful and sustainable blended learning pedagogic innovation. In this digital era, Web 2.0 affordances which include “more flexible, collaborative and creative learning” were likely to present opportunities to “students at risk of social exclusion” (Boulton, 2017, p.73). For instance, adult learners associated with the struggle to balance social, economic and academic demands and responsibilities (Folowo, 2007) were prone to exclusion socially and educationally. Nevertheless, pedagogic models that incorporate the use of Web 2.0 technologies increased the flexibility needed by adult learners. In this regard, Web 2.0 technologies were potential enablers of successful and sustainable blended distance learning for the adult populace.

Despite the identified benefits of Web 2.0 technologies, the reviewed literature has shown that Web technologies had a little impact on education in Lesotho (LCA, 2016). Nonetheless, existing institutional ICT infrastructure and available resources to the tutors and learners, however inadequate, were underexplored potential enablers of the proposed blended distance learning. For example, Mbete, (2015, p.51) reported low “actual usage” amid investments in LMS(s) by higher learning institutions in developing countries. These findings resonated with the notion that the challenges of ICT in education in developing countries could be the low utilization of available, even though limited, resources as opposed to the scarcity of resources or low economy. Existing ICT infrastructure such as LMS and available resources to the tutors and learners were therefore enablers of interest in this study.

Ssekakubo, Suleman and Marsden (2012) attributed the low utilisation of existing ICT infrastructure and resources to lack of innovation by universities amid “sufficient infrastructure and support" and lack of evidence-based system implementations. In addition, adoption of neither relevant nor user-friendly systems resulted in perceptions by tutors and learners in sub-Saharan Africa that LMSs were difficult to use (Bhalalusesa, Lukwaro and Clemence, 2013; Mayoka and Kyeyune, 2012) since they were not designed for their own needs. In agreement with Olulobe et al. (2016) and Moskal, Dziuban and Hartman (2013) therefore, blended learning innovations in any context must be evidence-based. In particular, usability (Mbete, 2015) and compatibility of LMS SOMETHING IS MISSING HERE to accessible resources to tutors and learners. This is why identification of accessible resources to the tutors and learners, training needs and pilot testing of blended learning, in the context of NUL, are the focus of this study.

Mbete (2015) recommended usability evaluations of LMS by institutions of higher learning to inform LMS usage, technological and pedagogical development of the tutors to upscale the design of quality learning material, improved support services, and increased awareness of LMS to potential users in developing countries. Usability evaluation of the NUL LMS was therefore a critical success factor to adopt ICT policy development, implementation and review. Such an approach could result in a rigorous monitoring, evaluation, and review process to inform not only the blended distance learning pedagogic model but also contextually relevant blended learning model(s) to be designed for NUL full-time programmes.

Usability evaluation could also inform the recommendations of compatible and affordable resources for tutors and learners. For instance, NUL and other institutions of higher learning in Africa could exploit the reported availability of mobile phones (Ng'umbi, 2013; Saidu et al 2012; Makoe, 2010; Mahenge and Nihuka, 2009; Furuholt and Kristiansen, 2007) depicted as an enabler of online learning. The next section focuses on the literature reviewed on the uses of a smartphone for instructional purposes.

2.14 Use of smartphones for instructional purposes

Web 2.0 technologies have availed opportunities (Boulton, 2017) for mobile learning comprising.

…portable or lightweight devices, such as mobile phones (also called cellphones or and handphones), smartphones, palmtops, and handheld computers (Personal digital Assistants [PDAs]), Tablet PCs, laptop computers and personal media players (Kukulska-Hulme and Traxler, 2005, p.1).

Furthermore, mobile learning (m-learning) has the connotations of flexibility in place and time, deemed essential in blended and distance learning (Otto, 2014; Falowo, 2007). As shown in the reviewed literature, smartphones were likely to be the most available instructional technology to the learners in higher education institutions of Africa (Ng'umbi and Rwegerela, 2013; Chiome et al., 2012; Makoe, 2010). For instance, a study of higher learning institution in South Africa revealed that 98.1% of the learners had either shared or exclusive access to technologies (Thinyane, 2010) while in one Tanzanian university 95% of the learners had access (Ng'umbi, 2009) to a mobile phone. Even though there was no clear indication of whether or not all the reported mobile phones were smartphones, this evidence provided a useful background to premise further investigations.

The Literature on Lesotho has revealed a strong correlation between the level of education and mobile phone adoption with about 98% of the population that owned mobile phones had completed tertiary education. Furthermore, in consensus with the historical records of a higher female literacy rate than male in Lesotho (World Population Review, 2018; Government of Lesotho, 2017), an average of 82% of mobile phone owners across the country were female; more (%) women were in possession of tablets/iPad and desktop computers while more (…% men owned laptops in comparison to women (LCA, 2017b, p.51). In addition, 60% of 24,226 students enrolled in higher education institutions of Lesotho in the 2014/15 academic year were females (LCA, 2016). The historical high enrolment of females in educational institutions as well as the higher female literacy rate than male in Lesotho (World Population Review, 2018; Government of Lesotho, 2017) therefore resonated with the correlation between the level of education and mobile phone adoption. However, empirical evidence was required to validate this perception.

Due to their portability and interactive learning features, pedagogic innovation in higher education entailed the use of smartphones and tablets for assessment of video-recorded role-plays, capturing and posting learning activities, and sharing ideas (Freedman, 2017, p.20). Though Lesotho was yet to exploit technology affordance (CHE, 2015a) including the “potential that mobile phones hold for poor communities”, the top 2 social and economic benefits identified by the respondents in a nationally representative ICT access and use survey were to check on the safety of the loved ones and know where they are (97.14%) and to save on travel time and cost (96.05%) (LCA, 2017, p.56).

Not only were mobile learning devices recognised for availability and accessibility to the learners, but they were also considered “extremely interesting for the educators due to the relatively low cost in comparison to desktop computers, spontaneity, and personal access to the vast educational resources of the internet” (Kukulska-Hulme, 2005, p.1). Nevertheless, Merriam and Bierma (2013) alluded to the risk of excluding adults with lower incomes if the introduction of ICTs such as mobile phones and personal computers becomes strongly market-driven. For example, the cost of mobile devices and Internet said to be relatively high in Lesotho (LCA, 2017) posed a threat rather than an enabler of equality in education. Hence, the urgency for the Government of Lesotho to develop contextually sensitive ICT and education policies. Moreover, the policies must cater for the educational needs of all, including those at the risk of exclusion due to their social and economic status or geographical location if SDG4 were to be achieved and if technology were to be an enabler, not a barrier, (Mupa and Chabaya, 2012; Makoe, 2010) to education.

Similarly, higher learning institutions of Lesotho, including NUL, must develop ICT policies informed by, among others, national and institutional dynamics as well as profiles or characteristics of the end users, namely, the learners (Chiome et al. 2012). Furthermore, the needs of full-time and part-time tutors cannot be separated from those of the learners if meaningful and effective policies are to be developed. The challenges, enablers and critical success factors for sustainable blended distance learning were key to the contextualisation of the envisaged pedagogic model for NUL.

Other than the policies, the concept of instructional design is also a key factor in technology integration at institutional level. The next section addresses this concept.

2.15 Instructional design

Critical educational change, including instructional design or redesign, required “a collaborative approach involving the broader community” (Livingston et al, 2017, p.12). This implied an all-inclusive and collaborative approach to raise the awareness to technology affordance for informed decisions of stakeholders regarding the need or value of blended distance learning. I therefore perceived the involvement of the tutors and learners (the learning community) important to facilitate collaborative knowledge construction of existing or available ICT infrastructure, digital literacy, and access (availability and affordability) of the Internet to the tutors and learners both on the IEMS campus and off-campus.

Branch and Kopcha (2014, p. 77) defined instructional design as “an iterative process of planning the outcomes, selecting effective strategies for teaching and learning, choosing relevant technologies, identifying educational media and measuring performance”. Although the concept of teaching and learning technologies is not new, the web evolution continues to provide “seamless, location-independent access to information services” (Beetham and Sharpe, 2007, p.4) and therefore opportunities for enhanced learning outcomes.

In consensus with Merriam and Bierma (2013) that Web 2.0 technologies facilitate meaningful learning to adults, a study by Boling et al. (2012, p.120) showed that adult learners found text-based, individualised learning with limited interaction less helpful than learning that was more interactive and incorporating the use of multimedia. Furthermore, different from traditional methodology described as "teacher-control-teacher-centred", modern methodology is student-centred and the role of the tutors is to "help the learners to process learning by encouraging, involving and helping them to try out and explore" (Karanezi, 2014, p.1568). Hence, the value of the use of the Web 2.0 technologies in teaching and learning to enhance the critical pedagogic aspects such as online learning and engagement (Cydis, 2015), individual and collective generation of the content by the users and sharing of knowledge (through interactive two-way communication), content creation and modification, as well as "support to collaborative and collective intelligence" (Choudhury, 2014, p.8097).

As indicated by Forest (2016), the instructional design process invariably necessitates the consideration of the following core components:

1) Assessment of the overall curriculum requirements
2) Analysis of the background knowledge and instructional needs of learners
3) Defining the overall course objectives
4) Determining the sequential order in which objectives will be addressed
5) Performing evaluations of the course (formative and summative).

These core components suggest that the redesign of pedagogy must entail some or all of the following:

Minimal or total course or programme redesign (Bates, 2015);
Restructuring and replacement of traditional face-to-face contact hours (Garrison & Vaughan, 2008);
Fundamental rethinking of "the course design to optimize student engagement" (Garrison & Vaughan, 2008, p.6)
Location of new technologies "within proven practices and models of teaching" (Beetham & Sharpe, 2007, p.3).

Flexible approaches aligned to the unique pedagogical characteristics of face-to-face teaching (Bates and Poole, 2003).

Furthermore, as opposed to the “off-the-shelf” strategies (Hamel & Valikangas, 2003) or “traditional market-led” eLearning approaches, Salmon (2005) proposed an adoption framework that matched internal factors (e.g. resources and skills) and external factors (i.e. opportunities and risks). Influenced by these perceptions, a SWOT analysis was conducted in this study to inform a pedagogic redesign. In addition, the suggested strategies, measures, procedures and processes for effective instructional design or redesign process identified in the reviewed literature included the following:

Initial restructuring (redesign) should have minimal impact on existing pedagogy, be gradually intensified, and aligned to ICT contexts (Bullen, 2014). For instance, gradual replacement of face-to-face elements (reduction of contact time), and a combination of online learning with small group face-to-face interaction.

Instructional design process must entail identification of distinctive or valued pedagogical aspects of face-to-face instruction that can be replaced or enhanced through technology, and forethought about explicit roles of tutors and learners (Bates, 2015). Hence the relevance of ‘intentional design’ to blended learning (Beetham and Sharpe, 2007; Bullen, 2015; Mainella, 2017) influenced by among others, sensitivity to, and learning from contextual factors (Mainella, 2017) and culture-bound ways of learning and teaching.

Professional development of tutors to foster selection and implementation of appropriate instructional technology (Yeh et al., 2016) for specific pedagogy and content. Hence, the relevance of Technology, Pedagogy, and Content Knowledge (TPACK) framework (Koehler and Mishra, 2009).

Drawing from the andragogic approach adopted in this AR, key to instructional design was the level of student engagement defined as “the student’s psychological investment in, and effort directed toward, learning, understanding or mastering the knowledge, skills and crafts that academic work is intended to promote” (Newmann, 1992, p.12). According to Croates (2007, p.136) “knowledge of student engagement characteristics" can develop pedagogical approaches to enhance involvement of all students, including "those students reporting more passive styles of engagement". Such passiveness could be attributable to the shyness or reluctance of students to take the risk of public failure (Graham et al., 2007, p.236).

Turner et al. (2014, p.1201) argued that students were "more engaged when they feel related to others, competent, autonomous and when academic learning is valued and meaningful". Instructional design must therefore aim to enhance connectedness, competence and autonomy of learning. With regard to digital instructional design, the importance of appropriate technologies to heighten these critical aspects (connectedness, competence, and autonomy) cannot be overemphasised.

Although student engagement is manifested in various ways, the reviewed literature identified two dimensions of student engagement that were important, at the stage of the induction of the participants, to instructional technologies. These were behavioural engagement and emotional engagement (Trowler, 2010, p.5) described as follows:

Behavioural engagement: students who are behaviourally engaged would typically comply with norms, such as attendance and involvement, and would demonstrate absence of disruptive or negative behaviour.

Emotional engagement: students who engage emotionally would experience affective reactions such as interest, enjoyment or a sense of belonging.

Furthermore, Turner et al. (2014, p.1197) suggested the following indicators of these dimensions of student engagement:

Behavioural engagement: Effort and persistence directed towards learning, understanding or mastering knowledge and skills;

Emotional engagement: Expressions of interest and positive affect.

These perspectives on student engagement signified that the effort and persistence demonstrated by attendance, involvement and absence of negative behaviour of the learners could be the indicators of behavioural engagement. Similarly, statements and actions suggesting interest, enjoyment or a sense of belonging would not only indicate emotional engagement of the learners in this study but also supportive attitudes towards the use of technology.

2.16 Summary of the chapter

Underpinned by educational change theories and frameworks (Fullan, 2007; Davis, 2018) and blended learning pedagogic models (Salmon, 2002b, 2003; Mishra and Koehler, 2006; Preston, 2007), this Chapter presented a critical review of the literature on blended learning and related concepts such as eLearning, online learning and distance learning. The chapter highlighted the importance of the policy across the institutional and global sphere in recognition of the complex educational contexts. Key to contextualisation of blended learning was awareness to and recognition of the specific critical success factors, the challenges and enablers of Internet-based instruction to each learning environment. Such approaches were likely to facilitate sensitive instructional design to the technology experience of the tutors and learners, as well as institutional and national ICT structure, strategy, and supportive to blended learning innovation in higher learning. At a pedagogic level, complete or partial instructional design must be informed by existing pedagogy, characteristics and needs of the learners and TPACK of the tutors. Furthermore, change in pedagogy must be gradually introduced. Chapter 3 sets out the methodology and research methods followed in this study.

CHAPTER THREE: METHODOLOGY AND RESEARCH METHODS

3.0 Introduction

This chapter provides an overview of philosophical underpinnings of this study as well as the rationale for the methodology and research methods employed. The chapter presents the research paradigm, my ontological and epistemological stance, research methodology, research design, research instruments and the rationale for their use, reliability, validity of data and generalisability of the results. Furthermore, I present my research positionality and ethics applied in order to enhance the objectivity of this study. The chapter ends with a summary of the research methodology and methods.

3.1 Research paradigm

Research paradigm refers to “a set of assumptions about how the issue of concern to the study should be studied” (Henn, Weinstein and Foard, 2009, p.11). Influenced by the purpose of determining a contextually sensitive blended distance learning pedagogic model for NUL, I deemed constructivism, referred to also as social constructivism, the most appropriate research paradigm to facilitate a deeper understanding of this object of study through “subjective, varied, and multiple meanings” (Creswell, 2014, p.8).

Constructivism is associated with the interpretive and qualitative research approaches (Clough and Nutbrown, 2012) since knowledge, reality or truth are “constructed by individuals and by human communities” (Merriam et al, 2010, p.414). This perception resonates with Vygotsky's (1978, pp.56-57) notion that cultural forms of behaviour were a product of internalisation and reconstruction of knowledge. For instance, an interpersonal encounter or process (external activity) transforms into an intrapersonal process (internal activity) resulting in "socially rooted and historically developed" cultural forms of behaviour (Vygotsky, 1978, p.57) (see figure 14).

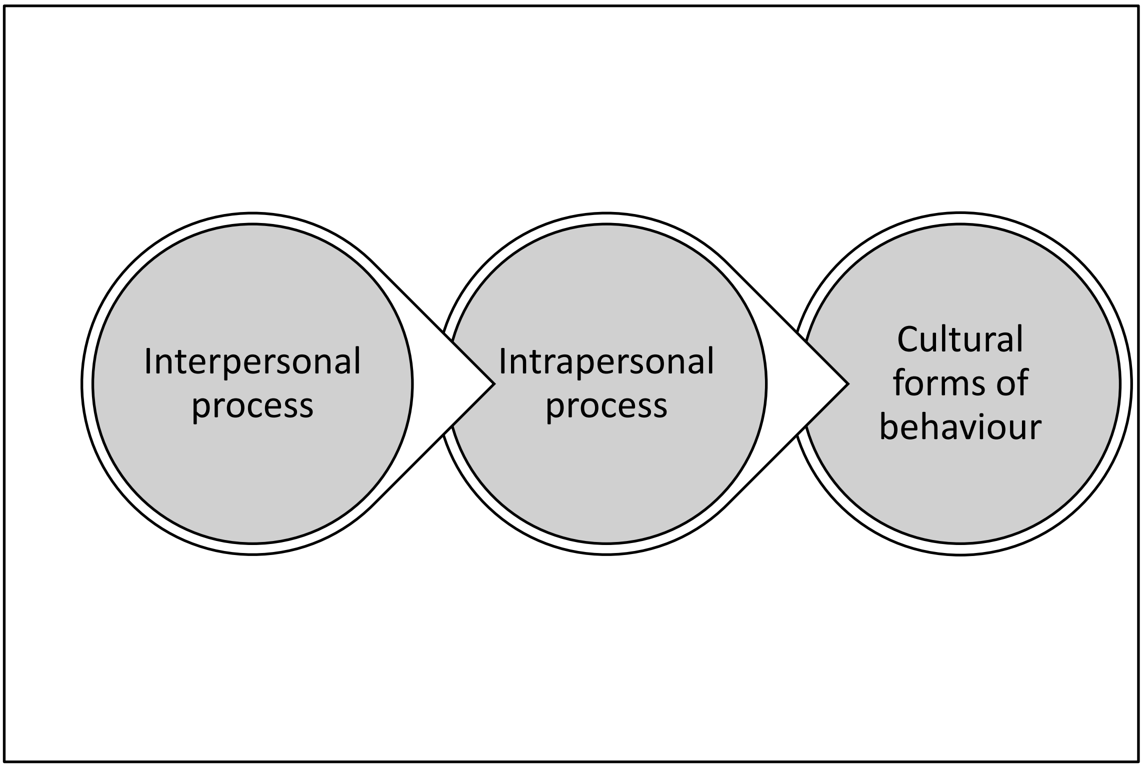

Figure 14: A conceptual model of the process of internalisation and reconstruction of knowledge adapted from (Vygotsky, 1978).

Vygotsky's (1978) conception of constructivism, therefore, depicts knowledge as a social construct influenced by culture in shaping meaning, function, and behaviour of an individual as well as the capability of an individual to internalise information, interact and collaborate with others to reconstruct knowledge. Hence, the exploration of prior technology experience of the tutors and learners to enhance an understanding of their cultural forms of behaviour in relation to the use of technology and their induction to the use of technology to facilitate internalisation, interaction and collaborative reconstruction of knowledge.

In the field on education, constructivism (referred to also as social constructivism) has been recognised for its strength to facilitate construction of “own knowledge” (meaning) informed by individual experiences (Leask and Younie, 2001, p.117); and negotiated meanings through interaction with others (Creswell, 2014). However, the paradigm has been criticised for lacking “connotations of inclusiveness, activity and collaborative working for the common good”(Leask and Younie, 2001a, p.119). This criticism led to the emergence of communal constructivism, characterised by among others, active engagement (interaction and collaboration) in knowledge creation, not only for the ‘self’, but for the ‘learning community’ (Holmes, 2001; Leask and Younie 2001; and Meehan, Holmes and Tangney, 2001).

Schrimshaw (2001, p.138) acknowledged that communal constructivism emphasises “inclusiveness, mutual responsibility and support, cooperative working and the use of real-life situations in education …” as well as the detail with which important procedural values embodied in education are specified. Nonetheless, the scholar further maintained that social constructivism and communal constructivism can supplement and complement one another if the former were best seen as “an explanatory and descriptive theory of learning”, and the latter as

a pedagogic theory concerned, not like social constructivism, with understanding of all learning but researching and understanding the ways in which good learning is brought about (Scrimshaw, 2001, p.136).

Furthermore, in consensus with Leask and Younie (2001), Schrimshaw (2001, p.135) acknowledged the potential of communal constructivism to be "a very productive strategy" in researching ICT-based approaches. The strengths of communal constructivism include:

Construction of knowledge by learners not only for their own benefit, but also for their learning community (Holmes, 2001; Leask and Younie, 2001; Meehan, Holmes, and Tangney, 2001; Girvanand Savage, 2010).

The theory is a useful strategy associated with ICT-rich pedagogical innovations (Girvan and Savege, 2010; Leask and Younie, 2001).

Many aspects of the theory are not new. What is new is "the synergy of the variety of different successful techniques and the use of ICTs to support the learning that has brought them together" (Meehan, Holmes and Tangney, 2001, p.187).

This study does not aim to polarise social constructivism and communal constructivism. Rather, I view both these concepts as critical components of knowledge construction and reconstruction from which communities of learning could benefit, the former providing a theory to guide knowledge construction while the latter focuses on the ways in which good learning can be achieved (Scrimshaw, 2001, p.136). Drawing on the ideas of Vygotsky (1978) (see Figure 14), therefore, knowledge construction can best be considered a continuous, progressive, cyclic process of transmission of socially rooted and historically developed knowledge, internalisation and reconstruction (see Figure 15).

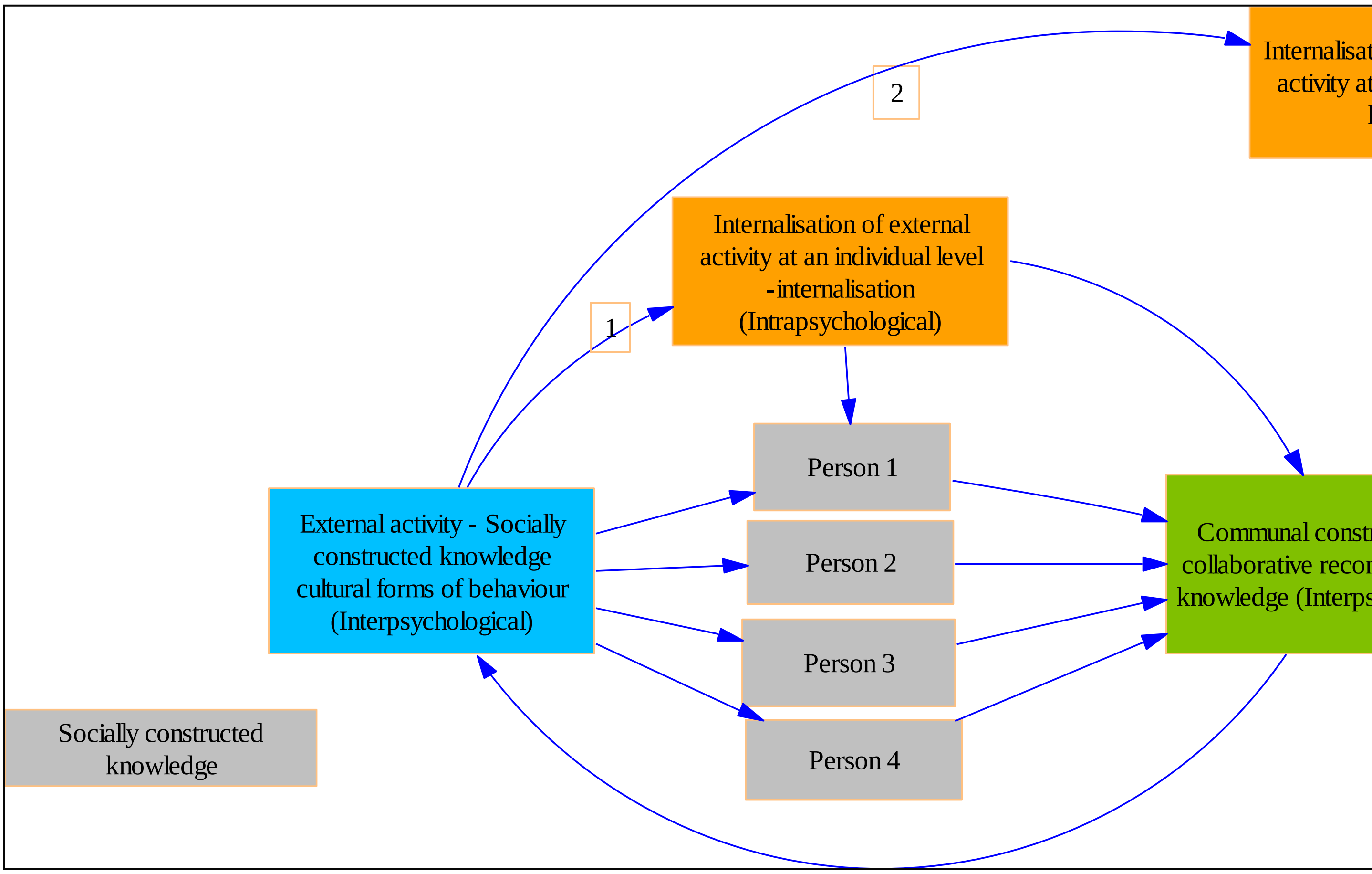

Figure 15: A conceptual model of knowledge construction as a continuous and cumulative process informed by the work of Vygotsky, 1978.

As shown in Figure 15, existing knowledge (i.e. socially rooted and historically developed) is transferred to individuals to internalise, interact and collaborate (Holmes, 2001; Meehan, Holmes, and Tangney, 2001; Leask and Younie, 2017) as well as reconstruct knowledge. With time, the communally constructed knowledge becomes socially-rooted and historically developed knowledge transmitted to the individuals for internalisation, interaction and collaborative knowledge reconstruction.

The knowledge constructed at the time of this study, in collaboration with the key stakeholders at national, institutional and course level constitutes new knowledge which may later transform into external knowledge (socially constructed knowledge). This may, therefore, provide the basis for the internalisation of the external knowledge of blended distance learning in Lesotho and similar contexts, interaction, collaboration and reconstruction of communal knowledge.

Given the intended "human problem-solving" intervention rather than the discovery of truth or reality (Powell, 2001, p.88), pragmatism could have also been applicable to this study. Pragmatists engage research methodologies similar to constructivism and values empirical research conducted in natural contexts, interaction and theory development (Reason, 2006, p.188). However, pragmatists are mainly concerned with finding useful and practical solutions ("what works") and not necessarily the process (the "how"). Hence, the appropriateness of constructivism to this study concerned with 'how' the knowledge of a relevant pedagogic model to the context of NUL should be determined and not only 'what works'.

In addition, theoretical frameworks that informed this study predominantly emphasised collaboration at various levels of the educational system in order to address the complexity of change. For instance, Salmon's (2002) Five-stage Framework provided a "constructivist model with clear progressive stages" (Moule, 2007, p.38), while Preston's (2007) braided learning theory addressed constructivist online learning communities in higher learning (Wong et al., 2003). The relevance of constructivism to this study was also influenced by my ontological and epistemological stance, discussed in the next section.

3.2 Ontology and epistemology

McNiff (2014) described ontology as the researcher's worldview (i.e. how you see yourself in relation to others) and epistemology as the researcher's perception of how knowledge is acquired or created. I see myself as a product of my environment, and therefore a social being. Knowledge is therefore a result of an interactive and collaborative process informed by subjective individual experiences, internalisation and interpretation of one's social environment. In this study, aimed to understand worldviews on technology-enhanced teaching and learning from the perspective of the participants, the relevance of constructivism was influenced by my ontological and epistemological stance as well as my researcher positionality discussed in the next section.

3.3 Positionality

The researchers' positionality influences the ways in which studies are conducted. For instance, research methodology, research design, processes and ethical practices are determined by one's positionality. In addition, the nature of people's questions and the moral intents are expressions of their positionality and will govern the ways in which they craft and change the research act itself (Clough and Nutbrown, 2012, p.10).

In agreement with the arguments that the positions of researchers are not static (GIVE SOURCE), the literature suggests that they are "determined by where one stands in relation to others" (Merriam et al 2010, p.411), and that insider and outsider positionalities may not always be polarised (McNiff, 2014). In this study I was predominantly an insider researcher. Arguably, my ontological stance (i.e. I am a social being), epistemological stance (i.e. knowledge is a social construct), and my full-time academic position at NUL supported the insider positionality. Nevertheless, positionality is not only influenced by the researcher's ontology (McNiff, 2014), but also by multiple factors such as power, representation, culture, race, gender, age, class, self-esteem, self-doubt, guilt, social and economic status, level of education, seniority and establishment of a rapport, among others (Bourke, 2014; Merriam et al., 2010; Chavez, 2008; Narayan, 1993).

During data collection across AR cycles, there were instances where I felt somewhere within a continuum with an insider positionality on one end and an outsider positionality on the other (Merriam et al., 2010) or "somewhere in between" (McNiff, 2014, p.33), not only outside the context of NUL but also within. For instance, prior to my departure for study leave in UK, I had no experience of pedagogic use of digital technologies. Prior to data collection, I was out of the country (Lesotho) for periods varying between three months to a year. Consequently, during the collection of data on prior technology experience in Lesotho educational context, I lacked the needed current knowledge or experience. Not only did my perceived inadequate knowledge trigger the feelings of self-doubt but it also rendered me an outsider researcher since the research participants had the required knowledge and experience. As a result, they were at a higher position of power than I was.

Nevertheless, as a full-time academic and former coordinator of the Diploma in Adult Education programme based at the IEMS campus (i.e. the study setting), the dynamics of “power relations” and “power-gaps” (Kumar, 2011, p.104) were prominent. For example, the study population comprised different positions of power such as the NUL management team who were all senior to me, the IT specialists and tutors comprising my seniors, peers and juniors as well as the tutors (full-time and part-time) and the learners who were likely to consider me their senior, given my academic and former administrative role of programme coordinator. In this regard, I encountered the reported “slippage and fluidity” between the insider and outsider states “in the real world of data collection” (Merriam et al., 2001, p.405) due to, among others, the power relations and power gaps (Kumar, 2014) not only in national institutions outside the scope of NUL but also within. Occurrences of positionality change are discussed in detail under data collection (see section 3.7).

Notwithstanding the limitations of the insider positionality (Merriam et al, 2010), I enjoyed the associated benefits such as expedience of rapport building, immediate legitimacy in the field, expediency of access and shared culture (including richness of language expressed through linguistics and non-verbal cues). Knowledge of the institution and its dynamics also enhanced my ability to protect and respect the dignity of the participants. For example, not only was I able to detect the gestures of discomfort or embarrassment but some informants actually verbalised their feelings, such as "… you are embarrassing me … the reason why I am saying I am embarrassed is that we have been waiting for our computer lab to be updated" (ILP06), thus validating my observed non-verbal cues as some of the participants responded. However, since I was considered a member of the society with some knowledge of our problems (my ontology), some participants not only laughed-off, but also shared sensitive issues with the aim to collaboratively find solutions (my epistemology). Informed by the constructivist school of thought, my ontological and epistemological stance and my predominantly insider positionality, the next section presents the methodology adopted in this study.

3.4 Methodology

The term 'methodology' has been conceptualised as the "strategies of inquiry", "approaches to inquiry" or "types" of research (Creswell, 2009, p.11). Dawson (2009, p.14) has, however, defined methodology as

> the philosophy or the general principle which will guide your research. It is the overall approach to studying your topic and includes issues you need to think about such as the constraints, dilemmas and ethical choices within your research.

Given the purpose of this study to determine a contextually relevant evidence-based blended learning model for NUL ODL programmes, AR was the most appropriate research methodology. A rationale for this choice of research methodology follows.

3.4.1 Action research methodology

As with the fundamental aim of this study, the AR methodology aims “to improve practice” (Elliot, 1991, p.49). Although it has been associated with the pragmatic research paradigm, in this study where knowledge construction was central, AR was best suited to facilitate a "better understanding of the nature of educational problems and thus add to the insights into teaching and learning” (Anderson, 2010, p.2).

AR has been acknowledged for its strengths to promote “independence, equality and cooperation” for improved self-esteem of the participants. Alderman (1993, p.8) provides a deeper insight to the contexts “and other complex conditions” (Yin, 2012, p.4) in educational settings; to enhance problem-solving in teaching and learning and to facilitate “current and future design principles” (Azimi and Fazelian, 2013, p.527).

With the aim to address a pedagogic need identified by the Management of a dual-mode institution (NUL), ODL learners and tutors were exposed to the risk of being accorded a lower status and unequal treatment in terms of resource allocation and treatment (Lephoto, no date). AR is described as need-based, practitioner-based, collaborative and a disciplined inquiry capable of facilitating a deeper understanding of our own practice (Cohen, Manion and Morrison, 2011; McNiff et al, 2003; Ferrance, 2000; Elliott, 1991) was therefore appropriate to empower the tutors and learners through their active involvement and participation in this study.

Action research is also described as an inductive process of “reflection, description, analysis and evaluation” which requires practitioners to have a certain amount of relevant experience of the phenomenon under investigation (Ashcroft and Foreman-Peck, 1994, p.186). From the constructivist perspective, as an academic at NUL, I was also empowered to address the identified need and learn from the 'reflective process' (Whitehead and McNiff, 2006) in collaboration with my colleagues in knowledge construction.

Influenced by communal constructivism which advocates the explication of the underlying procedures and processes of knowledge construction (Scrimshaw, 2001; Girvan and Savage, 2010), this study adapted Elliott's (1991) AR model. Although this model draws on the work of Lewin (1946), in consensus with Kemmis, McTaggart, and Nixon (2014), it clarifies processes and procedures involved in AR in more detail than the original model. Figure 16 presents Lewin's (1946) original AR model.

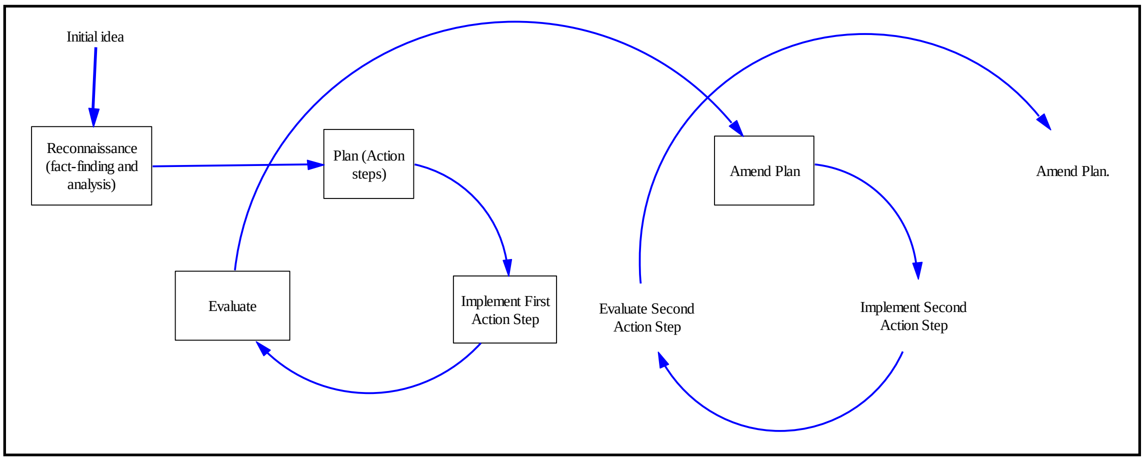

Figure 16: Lewin's (1946) action research model.

Elliott's (1971, p.71) criticism of Lewin's model included the proposal that the model could create assumptions that "the 'general idea' can be fixed in advance … 'reconnaissance' is merely fact-finding, … and 'implementation' is a fairly straight forward process". This is why his revised version allows 'the general idea' to change or shift as well as to introduce 'monitoring' of the implemented action steps prior to evaluation of the effects, among others (see Figure 17).

In view of the foregoing criticism, Elliot's (1991) revision of Lewin's model entailed recurrence and redefinition of the term 'reconnaissance' beyond the initial stage of the model. For instance, in the early stage of action research, the term refers to fact-finding and analysis. This implies a situational analysis aimed to provide "a broad overview of the action research context, current practices, participants, and concerns" (Tripp, 2005, no page number). Beyond the initial 'reconnaissance', the term referred to the explanation of any failure to implement.

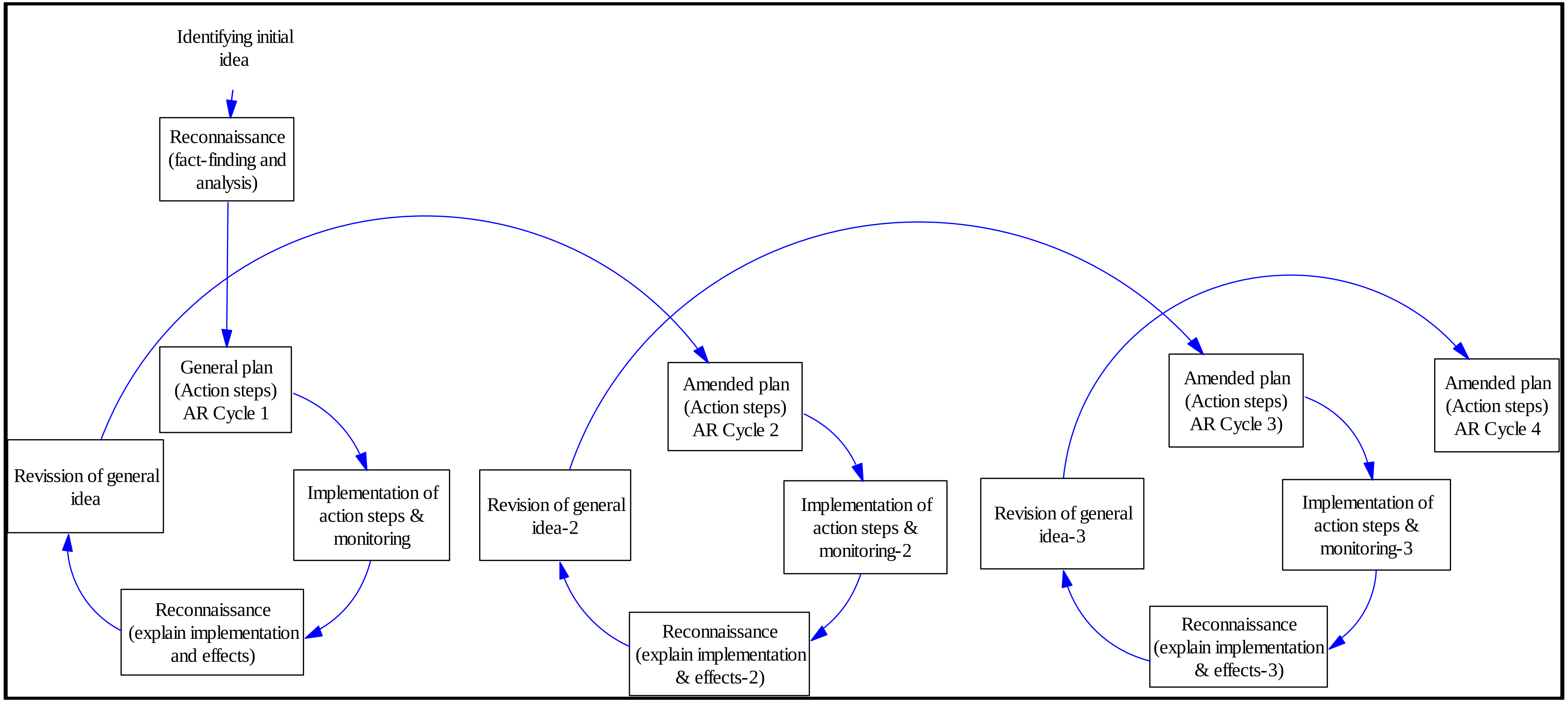

Figure 17: Action Research (AR) model adapted from Elliott (1991).

Although Elliott's (1991) model provided the needed guidance on how to conduct AR, the model has its own limitations which were addressed to suit the context of this study. For instance, Elliott's (1991) definition of the term 'reconnaissance' in the second and subsequent AR cycles (i.e. explain any failure to implement, and effects) presupposed an unsuccessful implementation of action steps. However, successful implementation was experienced at some stages of this study. The redefinition of the term to accommodate both 'failure' to implement and 'success' is as follows: *explain implementation and effects*.

Additionally, Elliott's (1991) model seemed not to anticipate emergence of information gaps in between the main AR cycles which needed to be addressed in order to facilitate progression to the next AR cycle. In their Problem-Solving Action Research (PRAR) model, Piggot-Irvine (2002, p.2) proposed "spin-off" cycles described as quick, shorter and/or less intensive cycles of planning, action, evaluation, and reflection to inform revision of the general plan. Although it can be argued that Problem-Solving Action Research (PRAR) comprising spin-off cycles (Piggot-Irvine, 2002) does not detail the action research process as much as Elliott's (1991) model, the notion of spin-off cycles portrays a reality which unfolded in this study. Consequently, I adapted Elliott's (1991) model to this study, mostly to include spin-off cycles (Piggot-Irvine, 2002), as illustrated in Figure 18.

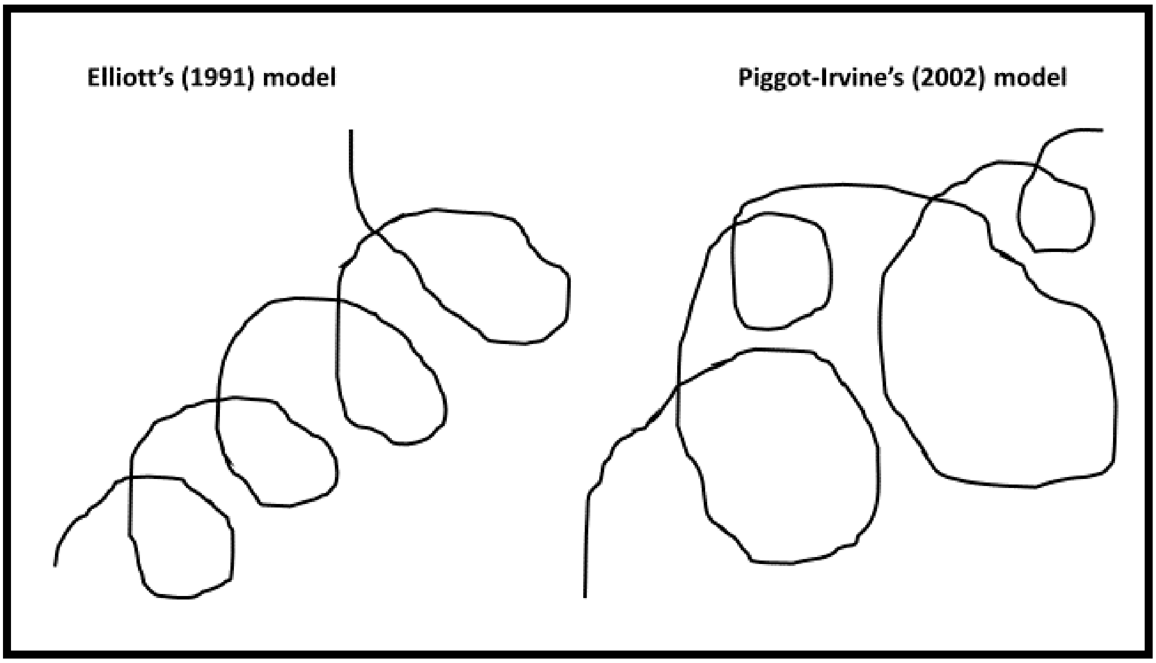

Figure 18: An illustrative comparison of action research spirals based on Elliott's (1991) model and Piggot-Irvine's (2002) PRAR model with spin-off cycles.

Despite the identified limitations of Elliott's (1991) AR model, the model was adapted to the context of this study as shown in Figure 19. The adapted version of the model entailed the use of Elliott's (1991) terminology together with Piggot-Irvine's (2002) sspin-off cycles. For instance, stages in action research cycles (i.e. *plan, action, evaluation and reflection)* were labelled as follows: general plan (Plan), implementation and monitoring (Act), reconnaissance (evaluate) and revision of the general plan (Reflect).

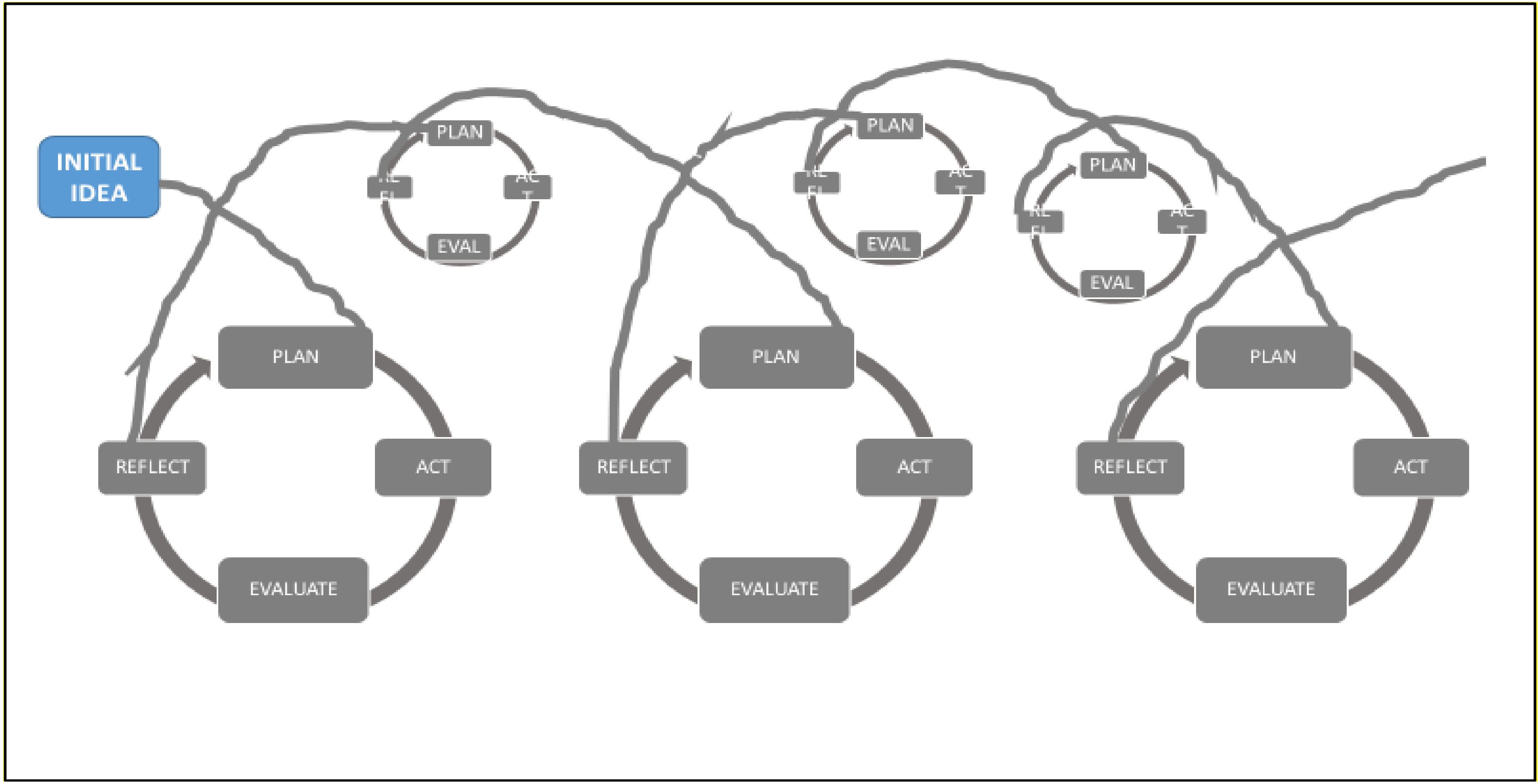

Figure 19: An action Research (AR) model adapted from Elliott (1991).

Further to Diagram 19 which illustrates the flow of the AR cycles and spin-off cycles of this action research, Table 6 clarifies how each AR cycle responded to the research questions (RQs) as informed by the theories and frameworks which guided this study.

AR cycle	**RQ**	**Level/ecosystem** (Fullan, 2007; Davis, 2018).	**Main activity/Focus**
1	1	National, institutional, and course level.	Reconnaissance (Elliott, 1991): *ICT strategy, structure, and support (Graham, Woodfield and Harrison, 2013)*.
	2	Course level.	Reconnaissance (Elliott, 1991): *Prior technology experience of tutors and learners; TPACK of tutors (Mishra and Koehler, 2006).*
	3	Course level.	Reconnaissance: *Existing pedagogy to inform new pedagogy (Beetham and Sharpe, 2007)*.
2	4	Course level and institutional level.	Implementation (Elliott, 1991): *Induction of tutors and learners to the use of technology (Salmon, 2002)*.
3	4	Course level and institutional level.	Implementation (Elliott, 1991): *Online instruction pilot study; policy development (Salmon, 2002; Preston, 2007).*
4	4	Course level and institutional level.	Implementation of change (Elliott, 1991; Fullan, 2007; Davis, 2018): a contextually-relevant blended distance learning pedagogic model.
5	4	Course, institutional, and national level.	Evaluation of the implemented pedagogic model.

Table 6: An overview of the research methodology and theoretical frameworks employed in this study.

Following this rationale for the adopted research methodology in this study, the next section presents the research design.

3.5 Research design

This study adopted convergent parallel mixed methods research design (Creswell, 2014) distinguished by among others, a joint discussion of qualitative and quantitative findings and display of results (see Figure 20). For instance, qualitative information collected through interviews, while quantitative data were gathered through questionnaires. Each data set was analysed separately. Thereafter, the results were triangulated and jointly displayed and discussed.

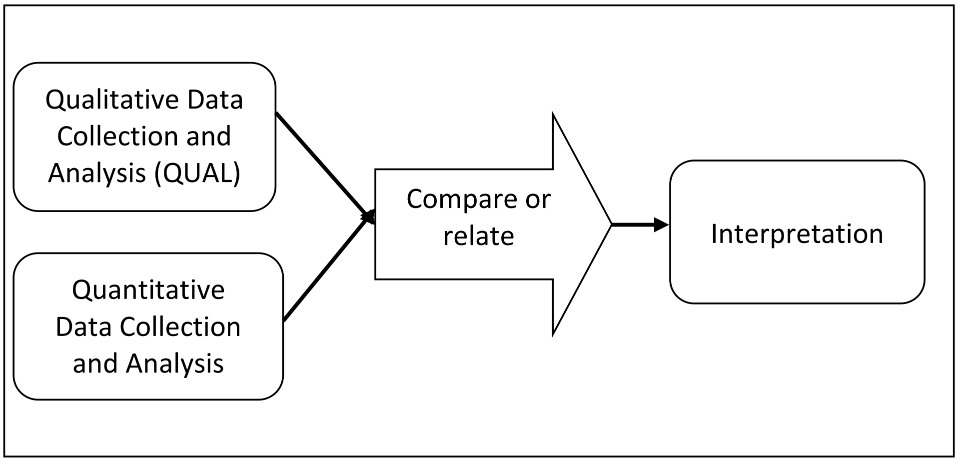

Figure 20: An illustration of the flow of the convergent parallel mixed methods research (adapted from Creswell, 2014, p.220).

Mixed methods research designs are described as a persuasive and rigorous collection and analysis of both qualitative and quantitative data for a deeper understanding and quantitative data for a general understanding of a research problem in a single study (Creswell and Clark, 2011; Olivier, 2009; Bazeley, 2004). Thus, a combination of these two approaches complements and supplements the strengths of each other (Johnson and Christensen, 2008) and also uncovers "information and perspective, increase corroboration of the data and render less biased and more accurate conclusions" (Reams and Twale, 2008, p.133). The use of mixed methods research design provides “a better understanding of research problems than either approach alone” (Creswell and Clark, 2011, p.5).

Although the standing of qualitative work has improved over the past few decades qualitative work is still viewed as less rigorous research by some non-qualitative researchers (Marshall, et al. 2013, p.12). Nonetheless, from the perspective of educational research comprised of social, behavioural and human sciences researchers, combinations of the qualitative and the quantitative approaches are reported to enhance the understanding of problems (Creswell and Clark, 2011; Johnson and Christensen; 2008). The convergent parallel mixed methods research adapted in this study (see Figure 20) therefore, enhanced opportunities for production of high-quality research (Creswell and Clark, 2011) to inform the proposed blended distance learning pedagogic model for NUL.

Education practitioners have questioned the usefulness of scientific research designs and methodologies in emergent processes such as action research (Ferrance, 2000). However, the research design is “the logic that links the data to be collected (and the conclusions to be drawn) to the initial questions of the study” (Yin, 2009, p.24); a procedural plan communicates the framework and strategy, detailing the ‘who’, ‘what’ and ‘how’ an investigation will be conducted to answer the research questions or problems “validly, objectively, accurately, and economically” (Kumar, 2011, p.94; Punch, 2014), hence the usefulness of the convergent parallel mixed methods research design in this study to enhance rigor, validity, objectivity and accuracy of conclusions (Kumar, 2011; Anderson, 2010; Yin, 2009; Koshy, 2005).

A mixed methods research design has been associated with the pragmatic research paradigm (Gilbert and Stoneman, 2016; Anderson and Shattuck, 2012) and criticised for “extensive data collection” and “time-intensive nature of analysing data” (Creswell, 2014, p.218). However, in this constructivist inquiry where little was known about the phenomenon of interest (blended learning within the context of NUL), the strengths of mixed methods research design which include a deeper insight and corroboration of data outweighed the challenges posed by the intensity of the process.

In addition, scholars have perceived mixed methods research design within a continuum with “monomethod” (Johnson and Christensen, 2008, p.445) - exclusive use of either a quantitative or qualitative research approach on the one end and a fully mixed research (Bazeley, 2004) on the other. In such designs, priority can be given to either one or both qualitative and quantitative approaches (Creswell and Clark, 2011). In an effort to obtain detailed accounts required in exploratory research questions (Johnson and Christensen, 2008) of this AR, the qualitative research design was predominant. For instance, data were predominantly collected through qualitative research instruments, supported by descriptive statistics to enhance objectivity.

Against criticism that qualitative studies were “biased, small scale, anecdotal or lacking rigor” Anderson (2010, p.2) has argued that AR can be “unbiased, in- depth, valid, reliable, credible and rigorous” when properly conducted. Furthermore, the qualitative research approach is viewed as useful in policymaking since it often describes “settings in which policies will be implemented” (Anderson, 2010, p.1). Thus, in the context of this AR aimed to inform policy, predominance of the qualitative approach cannot be overemphasised. Following the rationale for the use of parallel convergent mixed methods research design is a discussion of research methods adopted in this study.

3.6 Research methods

This section argues the research methods adopted in this study and the rationale for their selection. The section begins with an overview of the study population, sample, research instruments, validity, reliability, and generalisability of the findings. Thereafter, an overview of data collection and analysis procedures precedes a detailed discussion of specific procedures followed under each AR Cycle.

3.6.1 Population, sample and research instruments

Unless the total population of a study is identified in advance, "it is virtually impossible" to assess the representativeness of the selected sample (Cohen, Manion and Morrison, 2011, p.143). Although the focus of this AR was on the course level, the total population entailed multiple data sources (Yin, 2012), spread across the national and institutional level to generate comprehensive and rich data to inform a course design. This approach was influenced by, among others, educational theories on the complexity of change (Davis, 1989; Fullan, 2000; Fullan, 2006; Davis, 2018), TPACK (Mishra and Koehler, 2006), the Five-stage framework and e-tivities (Salmon, 2002; Salmon, 2013) and the work of Beetham and Sharpe (2007) on designing and delivering e-learning.

Central to this study was the course level consisting of the learners registered in NUL part-time or ODL programmes based on IEMS campus during 2014/15 – 2015/16 academic years as well as full-time and part-time facilitators or tutors in those programmes. The institutional population comprised IT managers, senior administrators of the institutes, departments and programmes that I perceived as key informants due to their designations or roles within NUL and the NUL Management Team (see Table 7). The national level comprised those whom I termed the 'national authorities' (i.e. representatives of the national ICT and education policy and decision-makers) and the 'users' of ICT in education (represented by Lesotho secondary schools). Informed by the reviewed literature on ICT and education in Lesotho (LCA, 2017; LCA, 2016; Isaacs and Hollow, 2012), this procedure identified the population to be information-rich cases. Table 7 provides an overview of the total study population intended and actual sample sizes, research instruments and the rationale for the selection of the instruments used across the three AR Cycles of this study.

Level	Population	Intended sample	Actual sample	Research instrument(s)	Rationale
National	Relevant Lesotho Government Ministries	2	1	Unstructured interviews	Scarcity of literature on existing national ICT strategies and structures to support education in Lesotho, and my limited knowledge of the subject area. Flexibility associated with unstructured interviews enabled use of "topic guide" and a different line of questioning 3 participant as determined by their responses (Henn, Weinstein and Foard, 2009, p.338).
	Lesotho Communications Authority	1	0		
	Lesotho Internet Service Providers	2	1		
	Secondary schools in Lesotho	3	3	Semi-structured interviews	In view of the lack of an explicit ICT and Education policy in Lesotho (Isaacs and Hollow, 2012; LCA, 2017a), the instrument allowed the needed, "relatively flexible questioning approach" (Henn, Weinstein and Foard, 2009, p.337) to enhance understanding of experiences and perceptions of users or non-users of technology in Lesotho secondary schools.
Institutional	NUL Management Team	4	3	Semi-structured interviews	A flexible approach to obtain much of needed data on ICT strategy, structure and support at NUL to inform the action research. In addition, power relations due to seniority of this sample required a balance between a sensitive, natural, unobtrusive and respectful interaction (Radnor, 2002), offered by the instrument.
	Senior Administrators	0	3	Focus group discussion	To gain deeper insight through an interactive and elaborate discussion between participants in an open and supportive, yet moderated environment (Braun and Clarke, 2013).
	IT specialists	2	2	Semi-structured interviews	To give some degree of autonomy (Cohen, Manion and Morrison, 2011) to the IT experts to chart direction of the interview since they were more knowledgeable in terms of existing ICT infrastructure and its capacity to support the envisaged blended learning initiative.

Level	Population	Intended sample	Sample size	Research instrument(s)	Rationale
Course design	NUL Full-time and Part-time Tutors on IEMS campus	18	30	Closed-ended questionnaires	According to Cohen, Manion and Morrison (2011, p.411) while questionnaires are prone to the risk of "often too low a percentage of returns", they encouraged greater honesty and reliability from 8% of the total population to quantify responses for objectivity. As a former senior colleague to some tutors, therefore, questionnaires were most appropriate.
		3	2	Semi-structured interviews	To give some degree of control of the interview to tutors in order to obtain relevant data on technology and pedagogy that I may not have included.
	NUL Part-time/ODL Learners on IEMS campus	233	190	Closed-ended questionnaires.	Enhance objectivity through use of a representative sample of learners in collaborative knowledge construction, in an underexplored subject area in Lesotho.
		20	19	Focus group discussion	To prompt, press, and probe for complete answers and responses (Johnson and Christensen, 2008) in a more supportive environment than one-to-one interviews; facilitate exchange of knowledge among participants, thus raising individual consciousness to technology affordances (Braun and Clarke, 2013); and in-depth and elaborate talk to each other about the subject of study while I served as moderator (Braun and Clarke, 2013) of the discussion.
		146	136	Analytics generated by 'Thuto'.	To enhance objectivity through descriptive statistics of participation in online activities by the learners and tutors.
		30	45	Open-ended questionnaires	To encourage greater honesty and reliability (Cohen, Manion and Morrison, 2011) at a stage where I had interacted with participants during the 6 months of fieldwork.
		15	24	Focus group discussion	To provide a moderated but open supportive environment for participants to talk in-depth and learn from each other, while I capture more detailed and elaborative field notes (Braun and Clarke, 2013) of the discussion.

Table 7: Research instruments used across AR cycles at national, institutional, and course design level and rationale for their appropriateness.

3.6.2 Sampling and sampling procedure

In this mixed methods research design dominated by qualitative research, non-probability samples were selected through a combination of purposive sampling and convenience sampling techniques. Purposive sampling enabled access to "critical cases" (Cohen, Manion and Morrison, 2011, p.156) by virtue of professional roles, power, knowledge and access to networks, expertise, experience and in-depth knowledge (Ball, 1990) about ICT and distance learning in Lesotho. The criteria for purposive sampling within my research were:

any key informant representing national and institutional ICT and education decision-making authorities; secondary schools; IT managers; Internet service providers; users, and potential ICT users in NUL part-time/ODL programmes (i.e. tutors and learners).

In the case of part-time learners, a maximum variation sampling technique, described as a variant of purposive sampling technique (Cohen, Manion and Morrison, 2011), was employed during the recruitment of the participants. I constantly made a conscious effort to encourage the representativeness (Merriam et al., 2010) of males and females ODL tutors and learners (i.e. separated in space and time between the institution, the tutors and other learners), engaged in social, economic and academic activities simultaneously and dispersed across different geographical locations (urban, semi-urban, rural, rural and remote). While this sampling technique implied larger samples than usually required in qualitative studies, Cohen, Manion and Morrison (2011, p.302) have argued that "the larger the sample, the more representative it is, and the more likely that the observer's role is of a participant nature". Hence, the relevance of the technique to this predominantly qualitative study conducted by a participant-as-observer (aiming for representativeness.

In combination with the convenience sampling technique, therefore, “opportunity samples” (McNiff, 2014, p.158) were selected throughout the AR cycles based on availability and accessibility of the respondents at the time of data collection (McNiff, 2014; Kumar, 1999). Sample sizes of different populations at different data collection stages were guided by the “fitness for purpose,” based on my own judgement (Cohen, Manion and Morrison, 2011, p.161) of the possibility to meet the objectives of each cycle (see Table 7) and the general rationale for the selection of each instrument. Non-probability sampling techniques such as purposive sampling technique have been criticised for their vulnerability to the researchers’ bias. Convenience sampling has also been viewed as economic on “time, money, and effort” at the expense of credibility (Miles and Huberman, 1994, p.28) or quality of information. The maximum variation sampling variant of purposive sampling technique was adopted to enrich data through documentation of “diverse variations” and common patterns (Punch, 2014, p.162).

The adoption of maximum variation sampling exposed the study to the risk of larger sample sizes than required in this predominantly qualitative study. Nevertheless, in the context of Lesotho which is characterised, by among others, the rural-urban digital divide and as well as the low and slow technology uptake (LCA, 2017a; LCA, 2014; Isaacs and Hollow, 2012; Yates, 2008) maximum variation sampling was appropriate to enhance the representativeness of the samples.

The factors related to the representativeness embedded in this study included the geographical distribution, social and economic status of the learners and gender. Consideration of these factors was influenced by the reported unequal distribution of ICT infrastructure and services (LCA, 2017b; LCA, 2014) likely to promote unequal access to ICT resources such as the Internet. Other factors included poverty associated with the rural areas (The International Fund for Agricultural Development, n.d.) where more than 70% (World Population Review, 2018) of the population lived; and gender-imbalance in Lesotho educational landscape with more females than males (World Population Review, 2018; Government of Lesotho, 2017; LCA, 2016; Government of Lesotho, 2005).

In recruiting the participants throughout the fieldwork I ensured the participation by males and females from diverse geographical locations in all ten districts of Lesotho. They were identified from urban, rural and remote areas to encourage voluntary participation by all.

However, in the case of one secondary school, synonymous terms to convenience sampling, namely, accidental or opportunistic sampling best describe the technique employed. I happened to be at a secondary school in a rural area to inquire about admission on behalf of my nephew. Getting into the school Office, I saw a desktop computer on the reception desk. This contradicted my preconceived idea that schools in such areas were not likely to have a computer in the office, as suggested by the reviewed literature on Lesotho. I therefore seized the opportunity to enhance objectivity of my study. The research instruments used in this AR are discussed in the section that follows.

3.6.3 Research instruments

Multiple research instruments were used in this convergent parallel mixed methods research to facilitate convergence, comparison (Creswell, 2014), corroboration (Johnson and Christensen, 2008) and triangulation of data (Gorman and Clayton, 2005; Sapsford and Jupp, 2006). These included both qualitative and quantitative instruments such as unstructured and semi-structured one-to-one interviews, focus groups, field notes, open-ended and closed-ended questionnaires (see Table 6, pp.108-109) as well as analytics generated by the NUL LMS (Thuto).

Following the rationale for the use of each instrument across all AR Cycles and levels (i.e. national, institutional, and course design) as presented in Table 6, similar questions were asked through these multiple research instruments. For instance, questions phrased in an open-ended form in the interview protocols, interview guides, and open-ended questionnaires were changed to closed-ended questions in closed-ended questionnaires.

While the selection of the intended population was guided by the reviewed literature, the intended sample sizes were influenced by the dominant research approach at each stage of the AR. For example, qualitative sample sizes were based on fitness for the purpose or objective of each AR Cycle. Intended quantitative sample sizes were informed by the recommended 10% of the population to achieve representativeness

(Cohen, Manion and Morrison, 2018). Predominant research instruments used in this study are discussed in the next two sections. They include the interviews and questionnaires.

Interviews

Qualitative research instruments included one-to-one interviews and focus groups. Although both instruments were appropriate for a “relatively flexible questioning approach” and addition of questions (Henn, Weinstein and Foard, 2009, p.337) were added where necessary, the focus groups provided the opportunities to elicit “a wide range of views, perspectives, or understandings” of this under-researched area (Bazeley, 2013, p.54) in the context of Lesotho.

Unstructured interviews

Unstructured interview guides were used (see Appendix 1) for “flexibility, freedom, and spontaneity in contents and structure” (Kumar, 2011, p.160) since my knowledge of ICT and education in Lesotho was limited. Unstructured interviews are also recommended in situations where the researcher is “not aware of what she [sic] does not know” (Cohen, Manion and Morrison, 2011, p.412). They enable the necessary freedom and sharing of power with the interviewees in directing the discussion while the researcher maintains the focus of the study.

Semi-structured interviews

In the case of secondary schools, semi-structured interviews were employed to give some degree of autonomy (Cohen, Manion and Morrison, 2018) to the teachers while maintaining control of the interview through the interview guide (see Appendix 2). However, the degree of autonomy was lower in semi-structured interviews than in unstructured interviews for the purpose of comparison of the responses of the teachers in different schools to similar questions. Interview protocols were also adapted from Graham, Woodfield and Harrison (2013) for the interviews of the NUL Management Team, key senior administrators and IT specialists (see Appendix 3).

Focus group

This study adopted Braun and Clarke's (2013, p.135) definition of a focus group as a "moderated group discussion based on the participants' perceptions and experience of a topic decided by the researcher" which emphasises "interaction between the participants rather than between the moderator or researcher and the participants". Different from one-on-one interviews, therefore, focus groups provided the needed open supportive environment in which the participants talked in-depth about real-life experiences among themselves rather than to the researcher as with one-on-one interviews (Braun and Clarke, 2013, p.110).

Similar to the general use of focus groups in conjunction with other research instruments rather than a "self-contained" method (Cronin, 2016, p.306), in this study the instrument ran parallel with closed-ended questionnaires (at the initial reconnaissance stage of this study) and open-ended questionnaires (during the summative evaluation of the fieldwork). In both cases, questions on the focus group schedules were similar to those on questionnaires to facilitate data triangulation.

Scholars have proposed varied focus group sample sizes ranging from 3 to 8 (Braun and Clarke, 2013, p.115) and 20–30 participants for grounded theory as well as 15–20 participants for a single case-study (Saunders and Townsend, 2016, p.3). On average, these three examples of proposed samples translated to a minimum of 13 and a maximum of 19. In this AR, the focus group sizes were guided by the fitness for purpose (Cohen, Manion and Morrison, 2018) with no hard and fast rules.

While large focus group samples posed challenges of recruiting the participants "who are geographically dispersed", managing the group, probing, time-management and general control of the group, this research instrument enhances the gathering of "new knowledge about issues little known about" and limits the power, control, and influence of the researcher (Braun and Clarke, 2013, p.113). Despite the large focus group sizes ranging between 19 and 24 participants in this study, the purpose to elicit reliable data captured in a moderated interactive discussion of participants' technology experience between themselves was met. Such environments were viewed as safer to the respondents than one-to-one interviews and likely to minimise the chances of personal bias (Braun and Clarke, 2013). Furthermore, in order to capture the essence of field observations throughout the data collection period (Gilbert and Stoneman, 2016; Bazeley, 2013) I captured the field notes to supplement and complement other selected qualitative research instruments.

Amid the logistical difficulties associated with the recruitment and organisation of focus groups (Braun and Clarke, 2013), this research instrument presented an opportunity to gather rich data through an interactive discussion of the object of study (among the participants), moderated by the researcher. An overview of field notes is provided in the next section.

Field notes

Field notes can be described as a descriptive record of critical events of what researchers, who are the primary research instruments, observe or hear (Yin, 2012, p.22). In this regard, the eyes and ears of the researchers are information gathering "tools" (Maxwell, 2013, p.88) which can facilitate "a level of accuracy" and comprehensive coverage (Henn, Weinstein and Foard, 2009, p.250). According to Henn, Weinstein and Foard (2009, p.248), data collection entails data selection and interpretation which requires the researchers to make "quick, sometimes unconscious, decisions about what is to be noted down and how to phrase it".

My field notes comprised observations of participants' behaviour, their comments, remarks as well as verbal and non-verbal expressions (Gilbert and Stoneman, 2016; Bazeley, 2013). Thus, the data collection process included "informal data-gathering strategies" (Maxwell, 2013, p.88) such as "jotting down notes, leading and concentrating on discussions with informants" (Saunders, Lewis and Thornhill, 2012, p. 345), capturing casual conversations with or among the participants where I deemed it ethical and making incidental observations related to access to and the use of 'Thuto' within and outside the study setting. For example, there were instances where the learners informally approached me in shopping malls to share their experiences and observations or seek help.

As with other research instruments, however, the impending influence of the researchers' "cultural and personal perspectives" (Yin, 2012, p.22) cannot be overlooked. Consequently, the field notes were predominantly used with other qualitative and quantitative research instruments to enhance objectivity. However, at some stages of this AR, field notes were used as a self-contained (Cronin, 2016) data collection instrument. This implies that descriptive records of events were captured during data collection and analysed as a separate data set. For instance, throughout the fieldwork, I always kept a designated note book on me or had a smartphone with a Microsoft OneNote application to capture notes. This was done to facilitate an "interim analysis" of data, described as cycles of data collection and analysis during a single study (Johnson and Christensen, 2008, p.531).

The field notes were initially captured as short or bulleted points of critical events, details of conversations and words and phrases used in a manner that would facilitate paraphrasing in "an almost literal account of what was being said" (Burgess, 1984, p.169). Although the field notes were guided by pre-determined themes derived from the reviewed literature. They included the national and institutional ICT strategies, structures, support and prior technology experience of the tutors and learners. The notes were not thematically organised. This was done to reduce the chances of blinded observation and recording of events at the expense of generating new ideas "out of the data" (Henn, Weinstein and Foard, 2009, p.250).

The use of a laptop computer to video-record the events also enhanced rigour and validity of the field notes. The strategic placement of the laptop to capture the activities from the entry to the exit of the computer lab enhanced the naturalness of the environment. Although in all sessions the learners' consent to audio-record the events was sought, the learners seemed to be oblivious to the presence of the laptop once the activities had started, since it was not manned. Although the laptop could not capture all the activities in the computer lab, these data provided a 'second chance' (Flick, 2009) to view the events. The next section addresses the questionnaires as the quantitative research data collection instruments that were used.

Questionnaires

A technology experience questionnaire developed by Kennedy et al. (2007) was adapted for reliability (see Appendix 4). The instrument was initially designed for a survey of technology experience of higher education learners in Australia. Thinyane (2010) adapted the instrument and tested it in the context of a South African university on a sample that included the learners from Lesotho. The testing of this questionnaire in various educational contexts and countries therefore rendered the instrument an effective, accurate, and consistent measurement of prior technology experience. It was piloted to enhance its reliability (see section 3.5.5).

Although self-administered questionnaires are associated with the limitations of a low percentage of returns and inability of researchers to answer the questions or clarify possible misunderstandings experienced by respondents (Cohen, Manion and Morrison, 2011), the adapted questionnaire (see Appendix 4) was not only appropriate to enhance objectivity but also to facilitated the participation of a representative sample of adult distance learners at IEMS, amid the time constraints. In addition, reliability of these questionnaires is as presented in the next section.

3.6.4 Reliability of research instruments

Reliability here refers to the "effectiveness of data collection instruments for taking accurate and consistent measurements of a concept" (Henn, Weinstein and Foard, 2009, p.336). Contrary to the perceptions that qualitative action researchers are concerned more with validity, reflecting "internal consistency of one's research," than reliability - reflecting "generalisability of [the] findings" (Koshy, 2005, p.106), reliability of data collection instruments and generalisability of the findings was central to this study. Reliability, which I considered synonymous with "quantitative validation" involving instrument measures (Punch, 2014, p.321), was achieved through the use of established frameworks and research instruments adapted to this study.

Examples of established frameworks and data collection instruments adapted to this study are Graham, Woodfield and Harrison's (2013) blended learning adoption framework and its interview protocol, and a technology-experience questionnaire (Kennedy et al., 2007) developed and tested in Australia and later adapted to the South African context (Thinyane, 2010). The process entailed initial editing of the research instruments informed by reviewed literature on ICT and education in Lesotho, piloting and editing of the instruments prior to data collection. The details of how the interview protocol and the technology experience questionnaires were tested in this study follow.

Interview protocol

An interview protocol developed by Graham, Woodfield and Harrison (2013) was edited to suit the scope and context of the study and piloted. Two senior administrators with the knowledge of ICT development and who were not going to participate in the main study, volunteered to participate in the pilot. After the pilot, the interview protocol was edited, mainly to replace the term ‘blended learning’ with ‘Technology-Enhanced Learning and Teaching (TELT)’. This was because in both interviews, the notion of blended learning was evidently unfamiliar to respondents. For instance, participants kept asking me to remind them the meaning of blended learning several times or pausing to recall the meaning before they could respond.

Similar to the national level, semi-structured interviews allowed for adjustments on the interview protocols to suit the roles of the participants. For instance, an interview protocol designed for an IT specialist would not include some of the questions directly related to the role of the management team, and vice versa. The next section addresses data collection procedures followed at the institutional level.

Technology experience questionnaire

Prior to the data collection, the instrument (see Appendix 4) was piloted and edited to suit the anticipated low digital literacy of the tutors and the learners reported in Lesotho (Isaacs and Hollow, 2012; LCA, 2017b)). With the help of one of the programme coordinators, seven of the Diploma in Adult Education second year learners volunteered to participate in the pilot of the questionnaires. This group was the closest to the intended sample (i.e. the first year I) as they had just completed the year in the previous semester. Furthermore, of all the second year I learners across the IEMS programmes, those in Adult Education were more accessible since that is where I am based.

The programme coordinator provided an overview of my study to one of the part-time or distance learners over the phone and asked whether the learners would like me to call them to elaborate. This was because the distance learners were usually on campus fortnightly and on weekends. Owing to the time constraints, it would be time-consuming for the programme coordinator to call numerous learners. Hence, my request for them to provide me with the contact details of any first learners to volunteer. With the consent of the learner, the programme coordinator provided me with their mobile phone number. I called the learner to explain the study in more detail, and upon verbal consent to participate, the learner directed me to their place of work to deliver a questionnaire. Owing to the existing pedagogy which entailed formal study groups, the identified participant provided mobile phone numbers of other group members, with their consent. I made personal calls to recruit the group members who in turn allowed me to deliver the copies of the questionnaire to them. Five of the seven learners completed and returned the questionnaire within the agreed timeframe set for purposes of pre-testing the questionnaire.

Feedback from the pilot of questionnaire showed that the Likert-like scales were too complex for diploma learners, as well as the listed types and uses of technology. In particular, the Likert scale that combined frequency of use of specific technologies and skills rating was said to be the most complicated. One participant illustrated the level of difficulty of the questionnaire by mentioning that they got to a point where they decided not to complete it. However, the participant got assistance from a friend to complete it.

In the case of the tutors, I distributed two questionnaires to one part-time and one full-time tutor, using convenience and purposive sampling. Feedback from the tutors revealed an omission of space for the participants to fill-in their programmes and levels and suggested a review of the age categories. The need to use simple terminology related to the digital devices and their use in education also emerged. For instance, lack of knowledge of some of the technologies listed on the Likert-like scales (see Appendix 4), such as "Dedicated video game console (e.g. Xbox, Playstation)" and "Dedicated digital camera" were later excluded from the questionnaires. removed.

Informed by feedback from the questionnaire pilot testing, all questionnaires were edited prior to data collection. However, while I had initially decided to remove some of the unknown technologies in order to minimise complexity of the questionnaire, in view of varied knowledge of technologies from the two tutors, as well as learners, I decided to retain most technologies. This, I did in order to generalise findings on digital literacy levels from the intended baseline survey.

Closed-ended questions from the edited questionnaire were summarised and rephrased/paraphrased to suit an interview guide for the focus groups, as shown in Figure 21. The use of closed-ended questionnaires and focus group discussion on the samples drawn from the same population was not only aimed for convergence, comparison (Creswell, 2014) and corroboration of data (Johnson and Christensen, 2008) but also to stimulate interaction and discussion among the participants to generate (Bazeley, 2013) rich qualitative data. Thus, complementing the convergent parallel mixed methods research design.

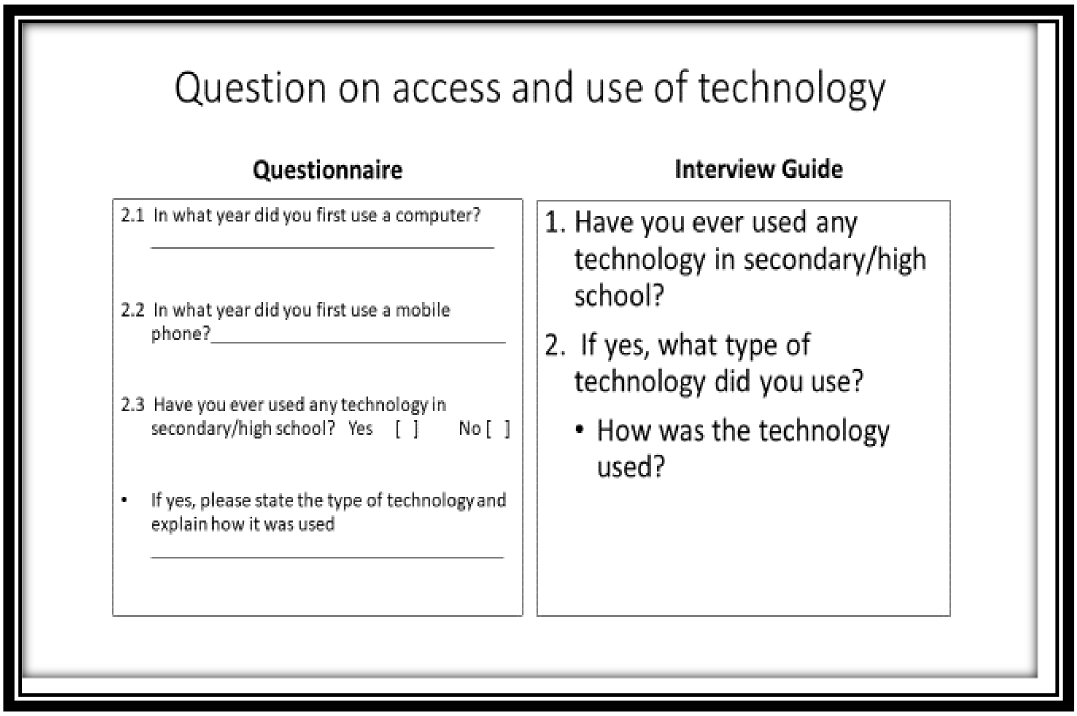

Figure 21: An example of technology experience questions both in a questionnaire and in an interview guide.

In addition to adapting established data collection tools for enhanced reliability, careful documentation of research methods, process and procedures render this AR replicable. For instance, detailed explanations of the process, adapted frameworks, structure and research instruments used in the study were carefully documented. Most importantly, throughout out the study and as much as possible, the records were stored both in hard and soft copy in a secure but retrievable or accessible manner if the study were to be replicated. More importantly, not only can reliability facilitate replicability of studies but also the generalisability of the findings (Koshy, 2005), as discussed in the next section.

3.6.5 Generalisability

According to Koshy (2005, p.106), reliability of research instruments reflects "generalisability of findings" of a study. In this regard, the use of established frameworks adapted from different countries and contexts such as Graham, Woodfield, and Harrison's (2013) interview protocol and Kennedy's (2007) technology experience questionnaires render the findings of this study generalisable.

Scholars have also argued that the qualitative findings can be generalised analytically or statistically (Kumar, 1999; Yin, 2012). For instance, the outcomes of the studies can be applicable in the contexts where the assumption is that "the case being studied is typical of" the study sample (Kumar, 1999, p.99). In this regard, this study achieved representativeness through a selection of representative samples of part-time or ODL learners in higher education, in developing countries contexts. Distinct characteristics of the study setting included the separation in space and time between the teachers and learners, self-directed learning, independent study, the learners' responsibility for their own learning space, time and pace, diverse geographical locations, academic, social and economic responsibilities (Malone, 2014; Coleman and Furnborough, 2010); as well as "multiple careers" (Cercone, 2008, p.139).

Furthermore, in qualitative research generalisability can be internal or external (Maxwell, 2002). While internal generalisability refers to generalising studies to persons, events and settings that were not directly observed or interviewed within a community, group or institution, external generalisability refers to generalising to typical communities, groups or institutions (Maxwell, 2002, p.53). This is why the maximum variation sampling technique adopted in this study included adult distance learners from diverse social and economic backgrounds to enhance the generalisability of the findings of this study. The findings of this study, therefore, are not only analytically and internally generalisable to adult and distance learning settings of NUL and similar contexts in higher learning institutions in Lesotho but also external similar contexts not directly investigated. These could be the similarities in national and institutional ICT strategy, structure, support and prior technology experience of tutors and learners. The next section addresses the validity of the findings of this study.

3.6.6 Validity

Primarily, validity refers to “accounts, not to data or methods” employed in a study (Maxwell, 2002, p.42), hence, the need for qualitative researcher to seek evidence to rule out threats to validity of particular features of their accounts through the “act of comparison” as a “logical device for establishing the validity of a line of argument” (Sapsford and Jupp, 2006, p.22).

In this AR, accounts were validated through the process of triangulation, defined as “a procedure for cross-validating information” collected from “several sources about the same event or behaviour” (Gorman and Clayton, 2005, p.13). Data were collected through numerous qualitative and quantitative tools and techniques which included open-ended and closed-ended questionnaires, unstructured and semi-structured interviews, focus groups, field notes, analytics of access and use of ‘Thuto’ and training attendance registers of the tutors and learners to corroborate data from different “angles or perspectives” (Elliot, 1991, p.83). Furthermore, owing to the cyclic nature of action research, at least two data collection instruments were used in order to flesh out “initial subjective observations or perceptions” and increase the “degree of authenticity” or content validity (Hopkins, 2002, p.133).

Amid the use of multiple research instruments to collect data, I could not overlook the risk of bias influenced by my inside knowledge or selectivity in data collection and analysis (Henn, Weinstein and Foard, 2009). As shown by Anderson and Shattuck (2012, p.18), inside knowledge could add as much as it could lessen research validity. In this regard, while I strived to remain sceptical, committed and detached (Anderson and Shattuck, 2012) from the study, I also engaged strategies to limit the chances of personal bias. These included respondent validation (Radnor, 2002), engagement of critical friends (Kemmis, McTaggart, and Nixon, 2014, p.190), legitimisation in the public domain (McNiff and Whitehead, 2011), back-translation (Ozolins, 2009; Son, 2018) and the act of comparison (Sapsford and Jupp, 2006) with grey literature. An overview of how these strategies were applied follows.

Triangulation

Gorman and Clayton (2005, p.13) defined triangulation as a “procedure for cross-validating information from several sources about the same event or behaviour” for “rigorous evidential trial of data” (Cohen, Manion and Morrison, 2011, p. 344). In this convergent parallel mixed methods research, triangulation entailed the collection and corroboration of qualitative and quantitative data (see Figure 20) from multiple sources, using numerous data collection instruments. For instance, qualitative data were collected through open-ended questionnaires, interviews and field notes to facilitate the corroboration of data from different "angles or perspectives" (Elliot, 1991, p.83). Perceptions of participants within the same context were then contrasted to gain some "degree of authenticity" by fleshing out my initial subjective observations and perceptions (Hopkins, 2002, p.133). In addition, as indicated by Yin (2009, p.122), diverse data do not only provide "evidence needed for the researcher to draw conclusions, but they also provide the evidential 'chain of evidence' that gives credibility, reliability and validity to the case study".

Respondent validation

Throughout the fieldwork and writing up this report, I adopted respondent validation strategy (Radnor, 2002), referred to also as respondent concordance (Kumar, 2011). According to Kumar (2011), adherence to this validation strategy which aims to seek agreement of respondents with interpretations, experiences, perceptions, conclusions, and presentation of the situation by researchers, was among the most critical features of qualitative studies. To this end, throughout data collection, I obtained respondent concordance through probing for clarity and paraphrasing during the interviews and focus groups to validate my field notes, iteratively listened to audio-visual records, disseminated the findings, conclusions and revised plans in between AR Cycles, applying informal conversational strategies on one-to-one or group basis where possible and emailed the interview notes of one-to-one semi-structured interviews to the respondents. The emails had a timeframe of two weeks for the respondents to provide feedback, after which I had clearly stated that they would be assumed to agree with the notes.

Use of critical friends

Scholars have acknowledged that observation and “interpretation of the same event or evidence can vary between different people” (Koshy, 2005, p.105), “self-deception” was imminent to the researchers (Kemmis, McTaggart and Nixon, 2014, p.189) and that researchers have the responsibility not only to monitor the actions and behaviour of respondents but also their own (Creswell, 2014). This is the role of critical friends, defined as “constructively critical” academics capable to disrupt or challenge some of the things taken for granted in a “communicative space for honest talk” (Kemmis, McTaggart and Nixon, 2014, p.189) about any aspect of a study.

Prior to data collection, I invited five NUL academics (who I perceived as capable to provide honest and constructive feedback) to monitor and observe my behaviour in relation to the participants and any other aspects of the study. I deemed the number adequate to maximise the chances of having at least one critical friend in most of my fieldwork activities. Out of these five colleagues, four were able to observe some of my activities and provide feedback. The Team consisted of one senior academic, two peers (both part-time tutors) and one programme coordinator. Regular feedback was provided at every available opportunity on a face-to-face basis, email and the social media (mostly a WhatsApp group which I created for ease of communication with the critical friends).

My criteria for the selection of these critical friends were academic qualifications, areas of specialisation, professional experience, anticipated level of knowledge of the subject of my study and my prior knowledge of their ability to provide critical and constructive (Kemmis, McTaggart and Nixon, 2014) views even on aspects considered a norm. While to some extent it felt risky to include colleagues perceived as sometimes too critical and honest, the value of constructive feedback to this study outweighed the risk. Feedback from these critical friends either confirmed or disconfirmed (Kvale, 1996) my observations and interpretation of the findings, thus enhancing the validity of the accounts in this study. Table 8 provides an overview of the selected critical friends or colleagues for enhanced credibility and quality of the study.

<table>
<tr><th>Highest educational qualification</th><th>Specialisation</th><th>No.</th><th>Common professional experience</th></tr>
<tr><td>PhD</td><td>Adult learning psychology</td><td>1</td><td rowspan="3">Former learners in adult and distance learning programmes;

Tutorship in Adult and distance learning programmes;

Management/administration of educational units or departments at national or institutional level;

Headship/Coordination of adult learning programmes.</td></tr>
<tr><td rowspan="2">Masters' Degree</td><td>Open and Distance Learning</td><td>2</td></tr>
<tr><td>Adult Education</td><td>1</td></tr>
</table>

Table 8: Attributes of selected critical friends for enhanced validity of accounts and quality of the study.

Legitimisation of results in the public domain

Throughout this AR, my work in progress was subjected to scrutiny, testing and critique in the social domain to enhance transformation or reconstruction of knowledge (Whitehead and McNiff, 2006). This was achieved through dissemination of work in progress through research seminars, workshops, and local, regional, and international conferences. For instance, a conference hosted by NUL to mark its 70th Anniversary in 2015 (see Appendix 5). Participants included colleagues based on the Main Campus of NUL and IEMS; tutors in other institutions of higher learning in Lesotho mostly serving as part-time tutors at IEMS and part-time tutors engaged in other social and economic sectors of the country.

The findings of this study were disseminated during the instructional design workshop hosted by NUL under the auspices of the Commonwealth of Learning. The purpose of the workshop was, among others, to design and customise an in-house template for all IEMS programmes. Thus, participants included the tutors (part-time and full-time) in all the credit programmes of IEMS. The focus of the initial workshop was on instructional design of blended learning modules for all First-Year courses. Nevertheless, owing to the Institutional support for the evidence-based blended distance learning pedagogic model, I sought and was granted access to the series of workshops together with all three Course AED270 tutors.

Back-translation

Back translation refers to “translation of a translated text back into its original language” (Son, 2018, p.89), preferably by bilingual translators who are native speakers of the “source language” (Weidmer, n.d., p.1229). Despite the diminishing recognition of the concept as a quality control tool (Ozolins, 2009; Son, 2018), back translation continues to be a “highly useful device” to facilitate “precise and comparable transfer of meanings across languages” internationally (Ozolins, 2009, p.1). In this regard, Paegelow (2008) advocated that the focus of back translation should be on 'differences that matter', as opposed to those that do not. I therefore adopted translation validation (Paegelow, 2008) with focus on meaning and not choice or preference of words which do not change the meaning (Son, 2018).

In this study, communication media were both English (target language) and Sesotho (the native/source language). Informed by the work of Ozolins (2009) and Son (2018), I created a table using Microsoft Excel Spreadsheet with the following columns: 1) Original/source text; 2) Initial translation; 3) Back translator's version; 4) Finalised version and 5) Justification of the finalised version (see Table 9). Thereafter, I captured original responses of the participants in Sesotho (source language) under the Original/source text column and my translation under the Initial translation/version column.

Original text	Initial translation	Back translator's version	Finalised translation	Justification
"Hei ... computer e thata...! ... Computer e thata ... feela ho monate!"	Hey… a computer is complex…! a computer is complex …but this is enjoyable (TS2L-07).			
Tsebo! ... e tlo re thusa le hare batla mosebetsi"	Knowledge! … it will help us even when we seek employment			
"…. Rea its'abella ..."	… we lack confidence (TSL1-07).			
"nna ke bone feela ke se ke bona tsoelopele e 'sudden!'	I just saw sudden progress			
Ha ke khone ho kena ho THUTO	I am unable to access…			
'hoba bang ba rona'	… because some of us …			

Table 9: An excerpt from a back-translation table of participants' responses in their native language (Sesotho).

Having filled in the first two columns of the back-translation table (see Table 8), I cut the second column (i.e. Initial translation) together with the 3rd which was blank (i.e. Back translator's version), pasted the columns to a Microsoft Word document, and emailed to my selected back translator. Criteria for the selection of the translator included that the senior academic was not only a bilingual native language speaker who was also one of my critical friends during fieldwork but was also …???. I therefore deemed their knowledge and understanding of the study context appropriate for "better approximations" (Weidmer, n.d., p.1229) of the content. On receipt of the Back-translator's feedback by email, I cut and pasted the 3rd column to my original table on Microsoft Excel to compare my initial translation to theirs, identified 'differences that mattered', finalised the translations and provided the rationale for the final translations under the Justification column (see Table 8).

In agreement with Weidmer (n.d., p.1229), I argue that the procedure followed to validate my translations was "much more effective than direct translation" which relies entirely on the judgement, competence and discretion of the translator "with little or no checks".

Grey literature

Grey literature has been described as secondary data, "usually written by experts" and more likely to provide recent information, considering the "significant time lag between research and publication" (Pappas and Williams, 2011, p.229). Despite the limitations identified by these authors that grey literature was neither peer-reviewed nor indexed in major bibliographic resources, Henn, Weinstein and Foard (2009) propounded that grey literature can provide rich contextual information with less researcher-influence or bias.

Amid the scarcity of the literature on ICT and education in Lesotho, especially at the beginning of this AR (i.e. 2014, recent reports by the national communications regulatory body of Lesotho (i.e. the Lesotho Communications Authority) provided relevant, neutral but rich contextual data gathered almost concurrently with this study and disseminated in 2016/2017. The reports were: 1) 2016/17 LCA Annual Report and 2) their first research report focusing on ICT and Education in higher learning institutions of Lesotho. Through the reports such as the inadequate ICT infrastructure in higher learning institutions of Lesotho and the limited digital skills of the tutors (LCA, 2017a; LCA, 2017b), some of the findings of this study were validated.

Having tested the selected research instruments described in this section (i.e. interviews, focus groups, field notes, and questionnaires) for reliability and the techniques in place to enhance the validity and generalisability of the anticipated findings of the study, an overview of how data were collected throughout the three cycles of this AR follows.

3.7 Data collection

This section provides an overview of how the qualitative and quantitative data were collected across the three cycles of this AT, taking into consideration the ethical considerations.

3.7.1 An overview of qualitative data collection

Qualitative data were mostly collected through interviews (unstructured and semi-structured), focus groups and field notes (see Table 6, pp.108-109). All interviews were suited to the preferences of the participants concerning the date, time and venue. The latter was predominantly their workplaces. This procedure enhances the required naturalness of interview settings in qualitative studies (Cohen, Manion and Morrison, 2011).

In gaining access to the key informants (Wolcott, 1988) in all settings, I observed existing organisational structures and communication channels. For instance, I reported and introduced myself to the receptionists, explained the purpose of my study, sought their guidance to identify gatekeepers and made appointments for the interviews where possible.

On the day of each interview, I reported to the key informants punctually, explained the purpose of the study and presented a letter of introduction from NTU (see Appendix 6). Having afforded the interviewees some time to read or browse through the letter, depending on their preference, I provided them with a consent form (see Appendix 7), gave them time to read, ask questions and sign it if they were willing to continue with the interview.

Prior to all the interviews, research instruments (interview guides and protocols) had been assigned identification numbers (IDs). This was because the instruments were used in soft copy during the interviews in order to capture the responses of the participants on the same document. In this regard, the data collection instruments became the interview notes.

Even though unplanned, the strategy allowed me to capture emerging questions and unanticipated information and, more importantly, to review and customise the relevant instruments for the subsequent respondents. In addition, while this process made data cleaning less time-consuming, data cleaning also entailed verification of IDs for each respondent, thus enhancing the accuracy of IDs.

The use of pre-assigned ID numbers enhanced the confidentiality and anonymity of the participants within the national, institutional and course design level. For instance, based on the intended sample, ID numbers of the interview guides for the national level ranged from National Level Participant (NLP0) One to eight (NLP08). Although only five of the intended eight participants could be interviewed, I retained the original numbering for enhanced anonymity. The strategy therefore rendered the participants not easily identifiable in terms of the sequence of numbers.

At the beginning of each interview, I explained the purpose of the study to respondents, gave them consent forms to read, seek clarification where necessary, sign and date the form. I also signed and dated the forms in the presence of the interviewees. Over and above the consent to audio-record the interviews stated in the consent form, I verbally emphasised the purpose and importance of recording the interviews. In addition, I clarified how I would ensure anonymity, confidentiality, and disposal of the audio-recordings.

Although most participants were fluent in English, in an effort to promote freedom, openness and a natural flow of the interview, I encouraged expression in their preferred language (i.e. the mother tongue, Sesotho, or English). However, questions were asked in English for purposes of consistency and accuracy. Using my laptop, I audio-recorded all the interviews, captured the notes during the interview in soft copy and saved these records at the end of each interview. Each interview took a minimum of one hour and a maximum of one and half hours. The inconsistency in the timeframe could mostly be attributed to my insider positionality (see section 4.6.3).

Data collection techniques applied during the interviews included probing, paraphrasing, clarification-seeking and capturing of any other useful information that came naturally during the interviews (Drisco and Maschi, 2015; Kvale, 1996). At the end of the interviews, participants were given the opportunity to ask questions, comment or provide any suggestions or recommendations for the improvement of the study. All the participants were duly thanked for their contribution to the study.

3.7.2 An overview of quantitative data collection

Quantitative data were mostly collected from the learners through closed-ended questionnaires adapted from Kennedy et al. (2007) and Thinyane (2010). The closed-ended questions, however, included a few open-ended questions. While collective administration (Kumar, 1999) of the questionnaires was more likely to yield a higher response rate, the limited time available to the intended participants in this study (i.e. tutors and learners) rendered the strategy not possible. Consequently, the questionnaires were self-administered. I personally recruited participants from the classrooms during scheduled face-to-face instruction sessions, distributed the questionnaires, and asked for a volunteer to collect them. The completed copies were mostly returned by the end of the same day or on the next day.

Self-administered questionnaires did not provide respondents with opportunities to seek clarification of my questions where necessary. In addition, it created room for the participants to collaborate in completing the questionnaire. In this context, focus groups that ran parallel with questionnaire provide opportunities for both the respondents and the researcher not only to seek clarification but also to clarify the responses.

With regard to the tutors, I went to the Common Staff Room for part-time colleagues on the IEMS campus to recruit and distribute the questionnaires. Although this was a place where the tutors in Adult Education Department signed in and out, part-time tutors came and left the campus at different times. Furthermore, I left some of the blank questionnaires in the Staff Room and the offices of Programme Coordinators of Business Management and Development programmes as well as Mass Communication since the tutors in those programmes signed in at those Offices. Over a period of five days, including a weekend since some of the face-to-face sessions only took place on weekends while some were on week days, I made several visits to all these offices and the Staff Room to collect completed questionnaires.

In the case of full-time colleagues, I made personal visits to each colleague's office on the IEMS campus (16) to recruit them and distribute the copies of the questionnaires where the participants verbalised their informed voluntary consent to participate. I also recruited some of the participants, as and when I met them on campus, outside their offices. Throughout this process, only one full-time colleague verbalised their unwillingness to participate.

The unwillingness of the one colleague could be attributed to the timing of this study which was conducted during an implicit major transformation of NUL which entailed technology-enhanced teaching and learning and transformation of IEMS to a fully-fledged ODL hub of NUL (Sejanamane, 2014; Ntsukunyane, 2016). For instance, the colleague raised concerns over the unclear definition of the envisioned ODL by NUL and the Internet costs associated with online learning off-campus. Hence, my interpretation of the encounter that the colleague was opposed to the ongoing transformation and therefore, associated this study with it. However, my effort to encourage the colleague to contribute these valuable views by voluntarily participating in this study were unsuccessful.

Out of the sixteen full-time colleagues, eight (50%) did not return completed questionnaires, despite my general gentle reminders for them to do so. This I did at least once within the five days of data collection, just in case there had been an oversight on their part. It is, therefore, possible that more colleagues than the one who verbalised their intention not to participate, associated this study with the then ongoing ICT developments. Thus, influencing their attitudes towards the study positively or negatively.

My insider positionality (McNiff, 2014; Merriam et al., 2010) in this study could also not be overlooked. Hence, my conscious effort to adhere to research ethics throughout the data collection process. The following section highlights the key considerations and strategies which I employed throughout this AR in order to limit the effects of potential bias and personal influence associated with my insider positionality.

3.7.3 Ethical considerations

Research involves collecting data from people and about people (Punch, 2005). Thus rendering an “ethical imperative,” a primary consideration in all research (Clough and Nutbrown, 2012, p.4), characterised by, among others, the researchers’ responsibility to protect the participants, develop trust through mutual respect, promote integrity of research and guard against any form of misconduct and impropriety (Creswell, 2014).

Key to ethical considerations in this study setting where I was an insider researcher and working with the participants who were either senior or junior to me, were the principles of “fairness, accuracy and comprehensiveness” (Elliot, 1991, p.64) and the recognition of power gaps (Kumar, 2014) and relations between myself and the identified sample (tutors and learners). Prior to each data collection cycle of this AR, I engaged in a critical reflection on my position, purpose of the study, and potential consequences of my behaviour on the outcome of the study.

Central to the data collection process were the principles of respect for human lives and values (Clough and Nutbrown, 2012) and protection of the respondents. Ethical considerations cut across *fieldwork planning, field conduct* and the *reporting* stages *(*David, Peter and Richard, 2015) of this research. An overview of how ethics were observed during fieldwork planning and field conduct follows.

Fieldwork planning

From the fieldwork planning stage, this study conformed to the Nottingham Trent University (NTU) Research Guidelines, attuned to the British Educational Research Association (BERA, 2011) ethical guidelines which emphasise compliance with the legal requirements of the European Data Protection Act of 1998 (replaced by the General Data Protection Regulations (GDPR) which came into effect in May 2018). Central to the data collection process were the principles of respect for all the participants and equal protection of researchers' intellectual rights and those of participants in terms of access, safeguarding and assuring good faith (Whitehead and McNiff, 2006).

In recognition of research ethics, I sought and obtained Ethical Clearance from the NTU Joint Inter College Ethics Committee (JICEC) prior to the commencement of data collection (see Appendix 8) and letters of introduction to the identified institutions of interest in Lesotho suggested by the reviewed literature (see Appendix 6) to negotiate entry to the field. These institutions included my workplace (i.e. NUL). As with other study setting, I sought permission from the NUL Registrar to collect data in writing (see Appendix 9) and it was granted. Following this plan is the discussion of the key considerations of my field conduct.

Field conduct

Key to my field conduct were the protection of the participants and their rights, respect, dignity and care. Protection was achieved through confidentiality and the use of identification numbers (IDs) and pseudo names for anonymity. In addition, I emphasised at all times the rights of potential respondents to voluntary participation and withdrawal, regardless of whether or not I had interacted with them prior to this study. For instance, the institutional level population included my colleagues (tutors) and learners who I might have taught in the past. My potential dual role (i.e. researcher-colleague or researcher-tutor) and associated power dynamics (Pearson, Albon, and Hubball, 2015, p.4) therefore posed a threat to the study, hence the strong emphasis on participants' right to voluntary participation without affecting our future relations.

Not only was the possible dual-role a potential threat to the study but it was also a constant reminder and therefore a reinforcer of adherence to the ethical considerations for objectivity. In almost all the activities, I kept reminding the participants that I was officially not performing any of my earlier roles and that their decisions to participate in the study or not or even to withdraw to withdraw from the study would not affect our relations. More importantly, at every opportunity I encouraged ownership of the study for enhanced understanding and improvement of the teaching-learning practice through collaborative knowledge construction, thus limiting my power.

Data collection in this study entailed shared power and control with the participants through their involvement and decision-making on fieldwork activities, such as the selection of suitable dates and times of activities and the use of unstructured and semi-structured data collection instruments to accommodate some degree of control by the respondents. In addition, throughout the AR, I treated each data collection within and across AR Cycles as new. This, I did in recognition that permission to conduct the study by gatekeepers did not imply continued informed consent of the participants. For instance, despite the permission of the gatekeepers to gather data and earlier consent for voluntary participation or withdrawal by respondents, I sought informed and signed consent anew for each activity.

In cases where practical activities were structured and planned with the informed consent of the participants, audio and visual recordings were done. For example, similar to a study by Burgess (1984, p.169), events such as "… entrance into the lab and participation …" were video-recorded on a laptop strategically placed in one corner of the venue to capture the events across the entire room and a tablet. This was because the ICT infrastructure at NUL was not developed to include the systems to record video and sound in classrooms and computer labs.

The audio-visual records were, however, for "second-chance" observation (Flick, 2009) rather than units of analysis. The use of a tablet was also meant for a closer look at events during data analysis. In the process, the use of a stationary laptop turned out to be more helpful than a tablet. This was evidenced by an observable distraction and change in behaviour of the participants as I approached them to capture ongoing activities using a tablet, despite their informed consent.

Although data collection procedures were specific to each AR cycle, I captured field notes throughout the fieldwork mostly to supplement and complement data collected through other research instruments. The field notes were guided by pre-determined themes derived from the reviewed literature, which included national and institutional ICT strategies, structures, support and prior technology experience of tutors and learners. However, I did not organise the notes thematically as I captured them. This was done to reduce chances of being overly prescriptive or blindly observing and recording events at the expense of generating new ideas out of the data (Henn, Weinstein and Foard, 2009). Specific data collection procedures followed in addressing the research questions of this study follow.

3.8 Data collection procedure

Influenced by the educational change theories which emphasise complexity (Fullan, 2007; Davis, 2018), this section provides an overview of the procedures followed in collecting both qualitative and quantitative data at the national, institutional, and course design levels or ecosystems in three AR cycles (see Table 7).

In full observation of my positionality (see section 3.3) and associated ethical considerations (see section 3.7.3), an overview of data collection procedures followed across all AR cycles of this parallel convergent mixed methods research design is presented under each data collection instrument used, namely, interviews, focus groups, field notes, questionnaires, analytics of Thuto.

3.8.1 Interviews

Unstructured and semi-structured interviews (see Table --) were employed to allow some degree of control of the interview to the participants since I perceived them more knowledgeable than I was. For instance, the questions at national level were mostly on existing ICT infrastructure and services in relation to education in secondary schools of Lesotho. The degree of control granted by the unstructured questions therefore enabled the key informants in such contexts to provide any information which they deemed relevant to the study.

Having empowered all participants to select dates, times and their preferred venues for the one-to-one interviews. I obtained their signed informed consent to participate in the interviews. The informed consent included typing the notes and audio-recording interviews. The interviews took approximately 1 hour.

3.8.2 Focus groups

Prior to each focus group I went to all the relevant categories of the participants, mostly NUL senior administrators and learners to recruit the participants for the focus groups. In recruiting the learners, I emphasised the importance of “representation” (Merriam et al, 2014, p.414) with the dispersed geographical locations and the unequal distribution of ICT infrastructure in Lesotho in mind (Molony, 2006; Yates, 2008; LCA, 2016a; LCA, 2016b). On each day of the event, having gone through the consent form with the potential respondents, I explained that the respondents could not withdraw their participation once the discussion began and gave those who might want to withdraw an opportunity to do so prior to the beginning of audio-recording. The focus group discussions took approximately One-and-half to two hours. Other than audio-recording, I took interview notes.

With the large samples that turned up for focus groups, my experienced challenges were mainly related to active involvement of all the participants in discussions. I therefore addressed this challenge by repeating and rephrasing the questions, seeking respondent validation of each point that was raised, repeatedly asking if anyone else had similar experiences and asking them to share different personal accounts if any. This strategy, however, implied more time than anticipated.

3.8.3 Field notes

Although I had predominantly collected field notes throughout the fieldwork to supplement and complement other research instruments, this section addresses stages where field notes were the “sole source of evidence” (Yin, 2012, p.22) due to the practical nature of data being collected (i.e. mastery of skills to access and use ‘Thuto’). The data were, however, triangulated with other qualitative and quantitative data collected at similar stages.

An example of such stages is the induction of the participants to online learning (i.e. the first stage of Salmon’s (2002) Five-stage framework). The activity entailed training or practical application of skills to use a computer and other personal devices of the participants which I had encouraged them to bring along, such as, smartphones, laptops and tablets for practice and identification of the challenges and solutions, where possible. Notably, though, the participants (i.e. the learners and tutors on IEMS campus) had not been accorded similar training to that of their counterparts on the main NUL campus because there was no functional computer lab. Field notes of these training activities were, therefore, captured and the activities were also video-recorded to facilitate iterative viewing for enhanced rigour and validity.

The training activities, facilitated by the relevant NUL personnel entailed access and use of ‘Thuto’ guided by the then existing ‘Thuto’ training module designed for the purpose (see Appendix 10), summarised in Table 10. Part A of the module focused on the introduction to the LMS (Thuto) and Part B exposed trainees to the features/tools of ‘Thuto’. Pedagogic functions of each tool from the perspective of NUL (2018) are also provided for ease of reference.

<table>
<tr><th>Part</th><th>Topic</th><th>Content</th><th>Pedagogic Function</th></tr>
<tr><td rowspan="4">A</td><td rowspan="4">Introduction to 'Thuto'</td><td>1) What is ‘Thuto’?</td><td rowspan="4">Accessing the LMS</td></tr>
<tr><td>2) Thuto accessibility – requirements.</td></tr>
<tr><td>3) Creating/resetting a password.</td></tr>
<tr><td>4) Logging on/in and off/out an account vs signing/logging out/off to close an application.</td></tr>
<tr><td rowspan="7">B</td><td rowspan="7">Introduction to features of ‘ Thuto’</td><td>Announcements.</td><td>posting current, time-critical information.</td></tr>
<tr><td>Assignments.</td><td>posting, submitting and grading assignment(s) online.</td></tr>
<tr><td>Chat room.</td><td>real-time conversations in written form.</td></tr>
<tr><td>Email.</td><td>sending mail to selected participants in your site.</td></tr>
<tr><td>Gradebook.</td><td>storing and computing assessment grades from Tests and quizzes or that are manually entered.</td></tr>
<tr><td>Polls.</td><td>anonymous polls or voting.</td></tr>
<tr><td>Resources.</td><td>posting documents, URLs to other websites, etc.</td></tr>
</table>

Table 10: A summary of the NUL 2015/16 module for induction of tutors and learners to use of ‘Thuto’.

3.8.4 Questionnaires

With the permission of all the relevant gatekeepers, I distributed the questionnaires to the participants, mostly at the course level (i.e. tutors and learners).

Although collective administration (Kumar, 1999) of the open-ended questionnaires was more likely to yield a higher response rate, time constraints rendered it not possible. Consequently, in all cases, I distributed a higher number than the anticipated return. For instance, on scheduled face-to-face session weekends, I distributed 150 questionnaires where 100 respondents were sought. The questionnaires were usually distributed on Saturdays to allow for collection either by the researcher or class representatives later in the day or the next day (Sunday). This was because the learners usually had a tight schedule of learning activities throughout their weekend sessions.

3.8.5 Analytics of 'Thuto'

From the beginning of the induction of the tutors and learners to the use of 'Thuto', the analytics of participation generated by the LMS were gathered across different AR cycles or stages of this study. For instance, at the beginning of the training (i.e. AR Cycle 2), the analytics validated the actual number of learners and tutors who accessed 'Thuto'. In AR Cycle 3, tutors and learners were asked to engage with the uploaded course unit presented on the proposed ODL template adapted from the Commonwealth of Learning (see Appendix 11). Specifically, the online learners (Salmon, 2002) were asked to communicate and interact with peers, tutors, and the researcher using the newly introduced tools of the LMS (announcements, assignments, resources, forums, chat room, and email). During the 4-week pilot, data were collected to determine the online learners' behavioural engagement (Turner et al., 2014; Salmon, 2005), measured through frequency of access and their online participation obtained from analytics of 'Thuto' on a weekly basis.

The weekly schedule of observations ran from Mondays (12:00 hrs) to Sundays (11:59 hrs) over a period of 4 weeks. The data collection process entailed the following:

generation of activity and statistical reports from 'Thuto' each Monday of the 4 weeks;

analysis of statistical data from reports;

reflection on the reports based on 'Thuto' analytics, taking into consideration emerging "concepts and patterns" (Birks, Chapman and Francis, 2008, p.68);

recording and describing observations as field notes;

analytical memoing of fieldnotes;

a reflective journal (Gilbert and Stoneman, 2016; Bazeley, 2013; Yin, 2012; Henn, Weinstein and Foard, 2009).

3.9 Data analysis

This section provides an overview of processes and procedures followed in analysing the qualitative and quantitative data collected in this AR. With the aim to determine a contextually relevant blended distance learning pedagogic model for NUL, both qualitative and quantitative data were collected from the national level, institutional level and course level using the instruments shown in Figure 22.

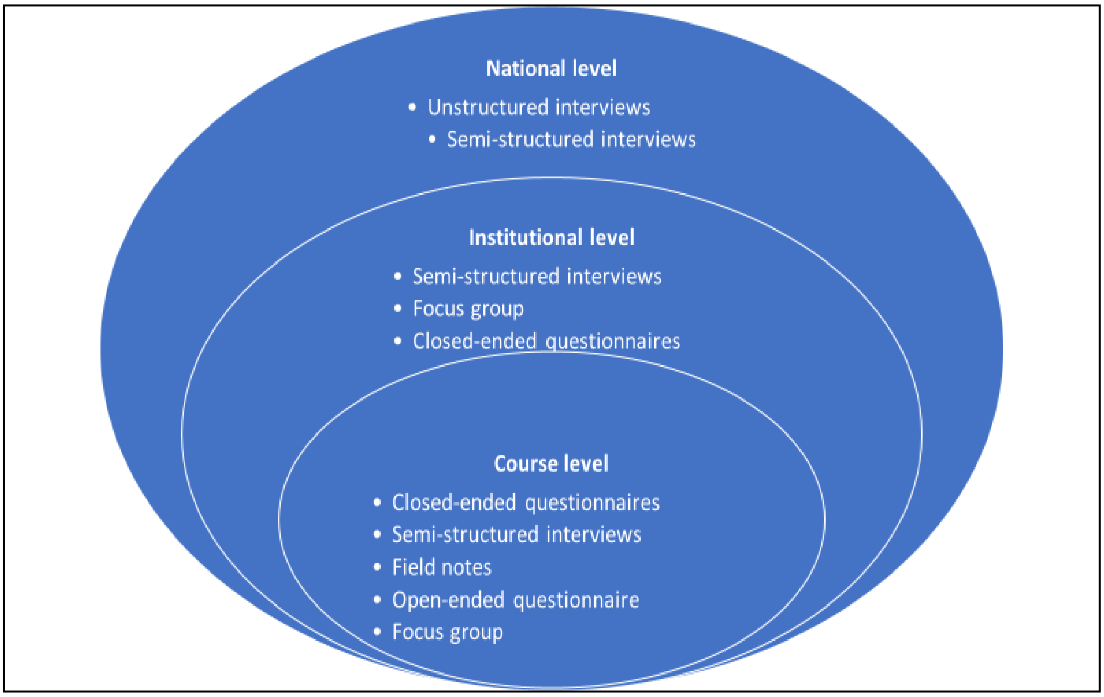

Figure 22: A summary of data collection tools used across the three levels or ecosystems considered in this study.

Influenced by the theories of educational change and its associated complexity (Fullan, 2006; Davis, 2018), this chapter discusses how these data were analysed in responding to the four research questions addressed in this AR. The first section provides an overview of qualitative and quantitative data analysis employed in this parallel convergent mixed methods research to inform a joint discussion of the findings (Creswell, 2014).

3.9.1 An overview of the qualitative data analysis

The most dominant qualitative data analysis procedures followed throughout the AR cycles of this study were content analysis and thematic analysis. Drisko and Maschi (2015, p.6) defined content analysis as a systematic and objective qualitative technique that uses frequency to determine the "relative importance of specific content" for enhanced credibility, validity and "replicable inferences from texts and other forms of communication".

Thematic analysis refers to a method of identifying, analysing and interpreting the patterns and meanings (referred to as 'themes') from qualitative data (Clarke and Braun, 2017, p.297). While the technique has been criticised for not being "very well-articulated" (Drisko and Maschi, 2015, p.7), Guest, Macqueen and Namey (2012, p.10) maintained that thematic analysis moves beyond counting explicit words or phrases and focus on identifying and describing both implicit and explicit ideas within the data. In this context, qualitative data analysis in this study entailed development of themes and identification of implicit and explicit patterns, relationships or links between the themes, with or without comparing code frequencies.

The choice between content analysis or thematic analysis of textual data was influenced by the purpose of data collection at each stage of this AR. For instance, content analysis was adopted in cases where my interest was on frequency of occurrence of sentences or phrases to determine the "relative importance of specific content" or enhanced credibility, validity and "replicable inferences from texts and other forms of communication" (Drisko and Maschi, 2015, p.6). In cases where I aimed to "rapidly identify and describe a limited number of major themes" (Guess, MacQueen and Namey, 2012, p. 50) from a small sample and I did not seek to quantify data to determine the importance of themes (Drisko and Maschi, 2015). Thematic analysis was applied.

Influenced by the work of numerous scholars such as, Clarke and Braun (2017), Guess, Maxwell (2013), MacQueen and Namey (2012), Saldana (2011), Cohen, Manion and Morrison (2011), Flick (2009), Johnson and Christensen (2008), Lewins and Silver (2007), Gibbs (2007), Sapsford and Jupp (2006) Neuman (2006) Tripp (2005), Miles and Huberman (1994), and Strauss and Corbin (1990) on qualitative data analysis, common steps in analysing these textual data were as follows:

Step 1: Record of all data sets

Drawing from Lewin and Silver's (2007, p.9) "main data analysis tasks", the process began with gathering and recording all the data sets. This was to ensure a chronological order for mapping emergence, evolvement and changes that led to other situations (Cohen, Manion and Morrison, 2011) where applicable.

Step 2: Data cleaning

Interview notes were "cleaned" (Guest, Macqueen and Namey, 2012, p.22) to ensure "completeness and accuracy" (Cohen, Manion and Morrison, 2011, p.407). This involved an iterative check of interview notes against audio recordings and filling the gaps where necessary. During the process, I paid attention to verbal and non-verbal cues such as a low or high pitch of the tone, noted the words "low pitch or high pitch" and an analytic memo of my interpretation. Dotted lines (…) were used to indicate a silence or pause and emphasis or repetition of statements which I interpreted as important to the interviewees, were captured verbatim. This process enhanced the development of "tentative ideas about categories and relationships" (Maxwell, 2013, p.105).

Step 3: Transcription of audio-recorded semi-structured interviews

I personally transcribed all the interviews, taking into consideration verbal and non-verbal cues. This exercise continued to promote immersion in data (Cohen, Manion and Morrison, 2011) closeness to data (Lewins and Silver, 2007) and appreciation of "the potentialities in the information" (Sapsford and Jupp, 2006, p.168). In the process, I listened repeatedly to the records, rewinding and slowing down the speed where necessary.

Step 4: Initial coding of data

Coding is defined as a "cyclic process with two or more cycles" (Saldana, 2011, p.8) of sorting the "elements according to a theme or topic that had to be looked at because it was central to the objectives of the research or the hypothesis" (Sapsford and Jupp, 2006, p.168) and labelling with symbols, descriptive words or category names (Johnson and Christensen, 2008). I began coding by "breaking down segments of text or data into smaller units" (Strauss and Corbin, 1990, p.61) informed by "first impression" phrases (Saldana, 2011, p.4) derived from the statement of the respondents.

For example, sentences and phrases related to the central themes and objectives of the study, namely, ICT strategy, structure and support, were colour-coded initially on hard copies of the interview notes and later in soft copy for the convenience of colour-coding, annotating and immediate storage of the record. This process involved examination, comparison, conceptualisation and categorisation of the segments of text (Strauss and Corbin, 1990) not only to familiarise myself with interesting patterns, surprising, puzzling or unexpected features and apparent inconsistencies but also to note the patterns (Cohen, Manion and Morrison, 2011). In addition, open (inductive) codes emanating and derived from the participants' responses were also developed and colour-coded. The next step was to develop a coding frame.

Step 5: Development of a coding frame

Guest, Macqueen and Namey, (2012) argued that a thematic analysis of small samples does not require a coding frame or a codebook, especially if there was only one coder. In this regard, I developed coding frames only where content analyses were applicable. A coding frame comprising priori codes emanating from the reviewed literature and developed before examining the current data (Neuman, 2006; Johnson and Christensen, 2008) and open codes derived from responses of participants was devised. A sample of the coding frames developed in this study is attached (see Appendix 12). Informed by Cohen, Manion and Morrison (2011, p.407) development of a coding frame entails a "random sample" of 10 percent or more to "generate a frequency tally of the range of responses as a preliminary coding classification".

Step 6: Axial coding

The second coding cycle, referred to as axial coding, entailed organizing and linking codes to discover key analytic categories, with the primary task to review and examine the initial codes, "… asking about causes and consequences, conditions and interactions, strategies and processes and look[ing[for categories or concepts that cluster together, or be divided, combined, organise into a sequence, or by physical location, or relationships…" (Neuman, 2006, p.463).

Cohen, Morrison and Manion (2011) explained that axial coding involved ascribing category labels to a group of both inductive (generated directly from data) or priori codes (developed before examining current data). In this regard, the next step was to develop the 'categories' column of the theme development table, using the generated deductive and inductive codes. This involved a review and sorting the colour-coded texts (codes) according to similarity in meaning, cutting, pasting and grouping them in soft copy of the theme development table. Codes in each group were read together to review their meaning and ascribe tentative category labels to them. All codes were matched and categorised, thereby leading to the stage of linking categories to deductive or emerging themes. Detailed explanations of processes and procedures followed at each stage of the AR are provided under relevant research questions. Next is a discussion of how field notes were analysed in this study.

3.9.2 An overview of the analysis of field notes

Field notes were assigned IDs sequentially and in order of chronology, starting from 1 in each AR Cycle. All field notes had a heading derived from the observed event and, where necessary, bullet points under the heading. For instance, the ID number assigned to the First Field note of AR Cycle 2 was FNAR2-01. Following the assignment of IDs to field notes, thematic organisation of the data entailed iterative reading of analytic memos and reflective notes written during and beyond data collection. These were matched to deductive themes and colour-coded. Inductive themes were then derived from the data that had not been colour-coded.

3.9.3 An overview of quantitative data analysis procedures

Quantitative data collected in all three AR cycles of this study comprised closed-ended technology experience questionnaires completed by tutors and learners and analytics of online participation by tutors and learners generated by 'Thuto'. For instance, descriptive statistics of the learners' access and use of the LMS (Thuto) were analysed alongside signed attendance registers of the learners per group, per session, the lists of the names of the participants experiencing the challenges of access to 'Thuto' and their own interpretation of the challenges and their reasoning. The Steps followed in analysing the quantitative data were as follows:

Step one: Data reduction

The data analysis process began with data reduction, defined as **“**the process of reducing the mass of data obtained to a form a suitable analysis, consisting of coding data in preparation for analysis” (Cohen, Manion and Morrison, 2011, p.407).

Step Two: Data cleaning

In line with the conceptions of these scholars, notwithstanding that the questionnaires could not be sent back to the respondents for corrections, all completed questionnaires were checked for completeness and accuracy (Cohen, Manion and Morrison, 2011) and then assigned identification numbers (IDs).

Step Three: Coding

Coding of quantitative data refers to a “process that is primarily aimed at transforming the information into numerical values” (Kumar, 2011, p.257). The procedure therefore entailed assigning numeric values to each question and its deductive responses on a blank closed-ended questionnaire. Inductive codes emanating from the responses of participants, such as not stated, were also developed as and when they emerged during the data analysis process. A sample of a coded questionnaire is attached (see Appendix 13).

Step Four: Data capturing

Using Microsoft Excel software, each question and each deductive response were captured across the columns of the top row, with the ID on the first column. Data on each questionnaire was then captured using the assigned IDs and numeric codes to generate descriptive statistics.

A summary of the methodology and research methods and procedures followed in this study follows.

3.10 Summary of the chapter

This chapter provides an overview of the philosophy guiding the study, namely, communal constructivism which not only emphasises interaction of the learners in constructing their own knowledge but also interaction and collaboration in constructing ICT-related knowledge for their learning community. Influenced by my ontological and epistemological stance and the purpose to improve our own practice, I was predominantly an insider researcher in this AR. Following a parallel convergent mixed methods research design, participants were selected from the NUL management team, relevant senior administrators in teaching and learning, IT specialists, tutors and learners through a combination of convenience and purposive sampling techniques across the three AR cycles. Validity and reliability were achieved through the use of established frameworks adapted to this study and multiple data collection instruments. Qualitative data were predominantly analysed through thematic and content analysis while descriptive statistics were generated to analyse the quantitative data. The results from all data sets analysed in this parallel convergent mixed methods research are presented in Chapter Four.

CHAPTER FOUR: THE FINDINGS

4.0 Introduction

Drawing on the educational change theories and frameworks (Fullan, 2007; Davis, 2018) and the AR methodology adapted from Elliott (1991), this chapter presents the findings across the three cycles and spin-off cycles of this AR (see Figure 19). With the initial idea to determine a contextually relevant blended distance learning pedagogic model for NUL, the findings are presented under the following research questions of this study:

What national and institutional ICT strategies, structures and support are in place for the envisioned blended distance learning pedagogy by NUL?

What prior technology experience do tutors and learners in existing NUL part-time/ODL programmes have?

How can blended distance learning pedagogy be adopted and implemented in the context of NUL?

What pedagogic model of blended distance learning is relevant to the context of NUL?

4.1 Research Question One

Influenced by Graham, Woodfield and Harrison's (2013) blended learning adoption framework adapted to this study, RQ.1 focused on three markers of progress or transition across the three stages of blended learning, namely, the existing *strategy, structure, and support* for ICT in education. These markers were explored both at the national (Lesotho) and institutional (NUL) level. The findings are therefore discussed under these two levels.

4.1.1 The national level

Following a thematic analysis of data collected from the Lesotho ICT and education national authorities and three secondary schools, Table 11 presents the development of themes which emerged from each of the three markers (i.e. strategy, structure and support).

The existing ICT strategy

As shown in Table 11, there was no explicit policy on ICT and education in Lesotho. Consequently, there were no frameworks guiding adoption and implementation of ICT across the country's educational landscape (i.e. from primary school level to higher learning). The country, however, had a separate national ICT policy and an education policy. There was no disconfirming (Kvale, 1996) data. Rather, Participant NLP01 stated that "… a policy was drafted years ago … but not approved by the powers that be".

ID	Code (Sentences/phrases)	Categories	Emerging Themes	BL adoption stage
National ICT strategy				
NLP01	Policy drafted but not approved – only the National ICT policy.	No explicit ICT and education policy guiding secondary schools in Lesotho.	No uniform definition of ICT-related subjects; no Education policy.	1
NLP01	Computer skills examinations are not mandatory – but some schools voluntarily register with the Lesotho Examinations Council. The exams are however, too theoretical, e.g. definitions of input/output device…!			
NLP06	IGCSE syllabus: optional, only 20 students can enrol due to infrastructure; selection done through a test, students admitted by performance rank order. Initially computer studies introduced in 2009.	No uniform description of or rationale for offering the ICT-related subjects in Lesotho secondary schools.		
NLP05	Introduced computers due to IGCSE requirement for computer lab and that all students must take computer studies amongst other subjects.			
NLP07	Introduced computer awareness as a subject at lower secondary level in 1992 and later made it compulsory and examined as a subject. The school consider computer skills as an important aspect of life. At upper secondary the subject was introduced in 2005 to prepare students for tertiary level and life in general. The subject was later made compulsory in line with LGCSE.			
National ICT Structure				
NLP04	2G; VID; 3G would be available across the country by the end of 2015; network upgrades in towns were also in the pipeline.	Unequal distribution amid continuous improvement of national ICT infrastructure and services in Lesotho.	Infrastructure developed to accommodate ICT-related subjects, despite the digital divide.	2
NLP01(a)	338 secondary schools (classified as lower and upper secondary); 326 have electricity; report on the number of those with computers awaited.	Continuous infrastructural improvements in Lesotho secondary schools.		
NLP05	Computer lab, Wi-Fi, colour printers, television set and DVD… Learners were also requested to bring own resources where possible; or share available facilities. Fortunately, most of the learners are from middle class families.			
NLP06	Wi-Fi hot spot, 40 computers (but only 10 connected to the internet) in 2 computer labs, 3 smart boards (2 in computer labs, and 1 in a classroom), 1 mobile projector.			2
NLP07	2 labs with 50 and 45 computers, networked computers with recent Internet speed across the school campus (e.g. common staff room, offices of the Principal and Heads of Departments and a phone shop (Internet café) for use by students outside the classroom and the general community.			

ID	Code (Sentences/phrases)	Categories	Emerging Themes	Blended learning adoption stage
Support				
NLP01	Computers bought for schools exempted from tax.	Limited support by Lesotho government toward integration of digital technology into teaching and learning.	Inadequate support for adopters of ICT in secondary school education of Lesotho.	1
NLP04	Reduced internet rates for the Ministry of Education, schools, and higher education institutions.			
NLP05	Teacher training (funded by the school)			
NLP06	Teacher training, including 3 teachers trained to train students.			
NLP01	Inadequately skilled teachers; no budget for ICT skilled teachers.			
NLP01	Maintenance of computers is also a problem – school overcharged for unnecessary services…. affordable school fees vs maintenance of computers.			
NLP01	Political issue … some schools want to go back to the M100 charge per students which the Ministry does not support.			
NLP06	Limited computer access to students.			

Table 11: A themes development table of the national ICT strategy, structure and support.

Other evidence of the lack of national ICT strategy included non-standardised computer awareness related-subjects in Lesotho secondary schools and a non-mandatory registration for examination of computer-related subjects by the schools. According to NLP1-07, their school introduced computer awareness in the early 90s as a subject because the school management viewed computer skills as an important aspect of life. In another secondary school, computer studies were introduced to meet the requirements of the International General Certificate of Secondary Education (IGCSE) curriculum for all the students to take the subject, since 1999 (NLP05).

The third school had initiated computer studies in 2009 at O-Level and later adopted IGCSE curriculum even though the subject was optional since only 20 students could enrol due to the shortage of computers. Students were given a test and admitted in rank order of their performance (NLP1-06). The differences in 'what', 'why' and 'how' computer-related subjects were offered, therefore, reverberated lack of explicit national ICT strategy in Lesotho (Isaacs and Hollow, 2012). Notwithstanding the lack of a clear strategy, the findings on existing national ICT structures follow.

The existing national ICT structure

The indicators of ICT structure in Lesotho were: the existing national ICT infrastructure and existing ICT infrastructure in the selected three secondary schools (see Table 3). In the context of this study, ICT infrastructure referred to "appropriate connectivity infrastructure and international access, a significant density of computers and mobile phones as well as wider access to sufficient electricity supply" (LCA, 2017b, P.24). The finding showed that the national ICT infrastructure was limited. However, it had been developed sufficiently by the local internet service providers to facilitate its use in secondary schools (see Table 11).

Although the statistics of schools with computers and electricity in the country could not be verified by the relevant national authority (i.e. the Ministry of Education) at the time of this study, the results showed that all the three participating secondary schools had acquired sufficient ICT infrastructure, in terms of computers with or without internet connectivity. Follow-ups on national statistics yielded no results up to the time of this write-up. Nevertheless, NLP1-01a (a key informant to which I was referred by NLP1-01) estimated that 326 out of 338 (96%) lower and upper secondary schools in Lesotho had electricity.

The existing ICT infrastructure in the selected three secondary schools in the study varied considerably. Factors such as motivation to introduce computer skills subjects, and the period in which the subjects were first introduced could be attributed to the differences. For instance, in one school where introduction of students to computers was an internal initiative, the infrastructure acquired in about two decades entailed a total of 95 computers with internet in two laboratories, networked computers in common staff rooms, offices of heads of departments and the school principal, a phone shop (internet café) serving students and the local community (NLP1-07).

Contrarily, in another, where the initiative came as a response to IGCSE requirements, not much development was reported (NLP1-05). Rather, the ICT infrastructure seemed to be deteriorating, as evidenced by among others, the number of dysfunctional computers, with no internet. Existing ICT infrastructure and sustained functionality in selected secondary schools of Lesotho, therefore, reverberated sufficiency of the national infrastructure to support educational innovations, provided there were sufficient interest and motivation in schools. The findings on national support towards the use of ICTs in secondary schools of Lesotho follow.

Support for ICT and Education in Lesotho

As reflected in Table 11, support towards ICT innovation in Lesotho secondary schools was both external and internal. Locally, support from the Government of Lesotho and the Internet service providers were identified by respondents. Government support was mainly in the form of tax exemption on ICT resources purchased for or by educational institutions and facilitation of external initiatives where opportunity arose. For example, the Government of Lesotho facilitated the New Partnership for Africa's Development e-Schools Demonstration Project (NEPAD) aimed to develop ICT infrastructure, which was "considered essential to the achievement of long-term, sustainable socio-economic development on the African continent" (Farrell, Isaacs and Trucano, 2007, p.v). Nevertheless, the project was described as "very expensive … state of the art initiative but expensive!" (NLP1-01). Internet, maintenance and security of ICTs could not be sustained beyond the life of the project in some of the participating schools.

Support in the form of ICT infrastructural developments (including power supply/electricity) in secondary schools, maintenance and security of the infrastructure as well as training of teachers was either limited or non-existent (see Table 11). These essential requirements in secondary schools were either self-sponsored or funded externally. For instance, supply of electricity to one of the secondary schools situated in a rural area had been sponsored by international or external donors. Notably, the school evidenced feasibility, usability and sustainability of existing ICT infrastructure and resources in Lesotho regardless of its geographical location. Furthermore, not only did the school provide digital literacy to students but it also extended Internet services to the rural community through an Internet shop.

With regard to the Internet service providers in Lesotho, educational institutions and the Ministry of Education benefitted through concessions or special dispensations on Internet costs (NLP1-04) , for example. Innovations such as solar powered lamps to facilitate reading at night and charging digital devices in areas without electricity (see Figure 23) were other ways in which the local Internet service providers supported technology diffusion. In this regard, expansion of the national ICT infrastructure and resources to promote equitable and sustainable internet access across the country was evidenced.

Figure 23: A solar-powered lamp and charger for devices such as mobile phones and tablets/iPads in areas without electricity.

The respondents in secondary schools were also asked about their perceived or experienced enablers and challenges in adopting the use of technology within the context of Lesotho. The findings are discussed in the next two sections.

Enablers of ICT use in Lesotho schools

Enablers of ICT use in Lesotho secondary schools were as shown in Table 12. While theparticipants acknowledged and appreciated that computers bought for schools were exempted from tax, the factors responsible for successful and sustainable use of technology in Lesotho schools included supportive vision of schools, innovation and enthusiasm of teachers and learners. These were evidenced by investment of schools on computers, teacher training and mechanisms to support and sustain their investments in ICT. For instance, two of the secondary schools (one owned by a religious institution and the other by a parastatal institution) acquired ICT infrastructure and trained teachers with little or no support from government.

According to Participant NLP05, students' high-interest in technology and parental support were other enablers. For example, students were happy to share the use of computers during class time and to bring their personal devices, such a laptops along, when asked by teachers to do so. These were some of the instances cited by the participant to illustrate the importance of parental support as an enabler. Although the study did not explore whether students sought parental consent to bring the resources along or not, it could be argued that availability and access to technology devices by the learners were indicative of parental support to digital literacy, even if not specifically intended for educational purposes.

ID	Code (Sentences/phrases)	Categories	Emerging Themes
	Enablers of use of technology in education in Lesotho		
NLP01	Computers bought for schools exempted from tax.	Support by government. Parental **support**. **Support** by ISPs.	Enablers of technology use in Lesotho secondary schools included external support, enthusiastic innovation, training and support of teachers, enthusiasm of learners, accessibility of mobile phones, and cost-effectiveness.
NLP05	Parental support is very important.		
NLP04	Reduced internet rates for the Ministry of Education, schools, and higher education institutions.		
NLP04	A project aimed to facilitate access to content was in the pipeline – details of which could not be shared.	**Enthusiasm** and **innovation** by internet service providers. Enthusiasm and innovation in secondary schools, which include training and support for teachers and students.	
NLP04	Sale of solar power charged devices for areas without electricity.		
NLP05	Teacher training (self-funded by the school).		
NLP06	Teacher training, including 3 teachers trained to train students.		
NLP06	High learner-interest.	**Enthusiasm** of learners.	
NLP07	Inclusion of computer awareness in the JC Syllabus contributes a lot to acquisition of computer knowledge and skills **at a considerably low cost** when included in school fees compared to students having to take computer awareness courses elsewhere.	Cost-effectiveness.	
NLP07	Use of mobile phones – BBTs – aware of WhatsApp and Face book by younger teachers and staff – but not sure of how it is used.	Access to mobile phones by students and teachers.	
	Challenges to the use of technology in education in Lesotho.		
NLP01	One external initiative could not be sustained beyond project life because it “was VERY EXPENSIVE… state of the art initiative but expensive!” e.g. Internet in schools could not be sustained.	**High costs** associated with use of ICT in schools – despite exemptions and reduced rates for educational institutions.	Challenges of technology use in Lesotho secondary schools include high costs, attitudes of teachers, balancing affordable fees with ICT maintenance and security costs, power cuts, inadequate government support, and limited resources.

ID	Code (Sentences/phrases)	Categories	Emerging Themes
NLP01	inadequately skilled teachers; no budget for ICT skilled teachers; NUL and LCE do train teachers.	**Attitudes of teachers** attributed to age (in terms mobile phone use for educational purposes) and low digital literacy.	
NLP01	Attitudes of teachers were also a problem due to technophobia - Some children knew more than the teachers.		
NLP07	Use of mobile phones – awareness of WhatsApp and Face book by younger teachers and students – but not sure of how it is used.		
NLP01	Maintenance of computers is also a problem – school overcharged for unnecessary services.	Affordable fees vs ICT infrastructure maintenance and security costs.	
NLP01	Political issue of affordable school fees vs maintenance of computers. Some schools want to go back to the M100 charge per students which the Ministry does not support.		
NLP01	Theft/crime was another problem.		
NLP05	2014 was a disaster – 10 to 20 computers were dysfunctional – some needed peripherals, internet was disconnected – router needed a new port – WIFI connection was tempered with…		
NLP05	Power cuts affected performance of computers.	Discordant responses.	
NLP07	No electricity problems – power failures experienced - but not a significant problem – why so?		
NLP01	Lack of interest by the powers that be… Some schools made their own initiatives without the involvement of the Ministry of Education … secured loans from banks in some cases.	Inadequate government support.	
NLP06	Limited computer access to students	Limited ICT resources to students – in schools and off school.	
NLP06	One teacher tried use of Facebook, but not all learners had access to technologies.		

Table 12: Perceived and experienced national enablers and challenges to the use of technology in education in the context of Lesotho.

Challenges to adoption and use of ICT in Lesotho schools

Identified challenges to the use of technology in schools comprised those that were not disconfirmed and those with rival explanations. For instance, the challenge of inadequate ICT skills of teachers associated with negative attitudes towards technology was not rivalled. Older teachers were generally viewed as technophobic, and with more limited digital literacy than younger teachers and students (NLP01; NLP07; NLP05). In one of the schools, younger teachers informally referred to older ones as BBT (Born Before Technology) and older teachers (NLP07) took this in good taste. Younger teachers and students in that school used applications such as WhatsApp and Facebook. However, some owned mobile phones but lacked knowledge of how to maximise its use. The mobile phones were mostly used to make calls and texts (SMS).

Another common challenge with no disconfirming (Kvale, 1996) evidence was inadequate support to educational institutions by the Government of Lesotho. In all participating schools in this study, none of the respondents alluded to any form of Government support towards the use of technology, other than tax exemption. The respondents perceived teacher training and basic ICT infrastructure in schools as some of the areas in which the government of Lesotho could provide support.

In consensus with the two Internet service providers in Lesotho (ETL and VCL), the high cost of ICT devices and data were identified as barriers to access and use of the Internet in secondary schools, despite the 3G and 4G coverage estimated at above 90% (LCA, 2017b, p.27). However, perceptions on affordability of technology use in secondary schools differed. Participants NLP05, NLP01, and NLP07 alluded to ongoing struggle to balance affordable school fees with the costs of internet, maintenance and security of ICT infrastructure. For instance, NLP01 cited the inability to sustain an externally initiated ICT in Education project in six secondary schools of Lesotho due to very high costs of the internet, maintenance and security as evidence.

On the other hand, NLP07 maintained that, considering the value of digital literacy as an employability skill and the cost of private computer awareness courses to students, the costs associated with computer awareness subjects were “considerably low” if included in tuition fees and spread across the school year. It can therefore be argued that the cost of ICT to this school was value-laden and the strategies to meet the anticipated social and economic status of tuition fee payers were devised.

Differences also emerged in the case of frequent power cuts in Lesotho, identified as a major challenge that impacted on the functionality of computers (NLP05) while according to NLP07, there were no problems related to electricity in their school. Even though the school experienced power failures, these were not considered as a significant problem. Further exploration of reasons why power cuts were not a considerable challenge to the school was unsuccessful due to unavailability of a suggested key informant (Walcott, 1988) on technical issues. Nevertheless, given the value placed by the school on ICT, evidenced by infrastructural developments despite its rural location, it was possible that the school had mechanisms such as uninterrupted Power Supply (UPS), solar powered devices or generators (Ngimi and Nihuka, 2013). The next section presents the results from the data collected at the institutional level.

4.1.2 The institutional level

In response to the question on existing institutional ICT strategy, structure and support, Table 13 presents a content analysis of data collected from a total of eight respondents, namely, the members of the top NUL Management Team (3), the relevant senior administrators (3) and IT specialists (2). Key to the emerging themes were the findings that:

Individual administrators and IT specialists identify specific blended learning benefits;

No uniform definition of blended learning; no policy in place;

Individual NUL units, key administrators and IT experts informally advocate the use of technology;

Infrastructure was not expanded to accommodate blended learning across the NUL programmes;

No instructional design process was in place to help the faculty to design blended learning courses;

Inadequate technical and pedagogical support for blended learning adopters;

Inadequate support for the learners.

CODE TYPE	CODE (Subcategories, Kvale, 1996, p.197)	TALLY	TOTAL	CATEGORIES (Main dimensions, Kvale, 1996, p.197)	EMERGING THEME	BL ADOPTION STAGE
Ques. 1 (a): What would be the **primary purpose** of blended learning in NUL part-time/ODL programmes?						
Priori	Improved pedagogy	/////	5	Lack of common institutional purpose motivating blended learning adoption	Individual administrators and IT specialists identify specific blended learning benefits.	Stage 1 Awareness and exploration of blended learning
Priori	Access and flexibility	////	4			
Priori	Cost effectiveness	///	3			
Open	Improved performance	/	1			
Open	Professional development of tutors	/	1			
Open	Increased enrolment without constraints of physical space	/	1			
Open	Interaction	/	1			
Open	Collaboration (national, regional and international)	/	1			
Open	Keep up with 21st Century education trends	/	1			
Question 1 (b): What **definition** of blended learning could NUL propose?						
Priori	A combination of face-to-face and online instruction	/	1	Different perceptions of NUL blended learning definition.	No uniform definition of blended learning; no policy in place.	Stage 1 Awareness and exploration of blended learning
Priori	A combination of face-to-face, print media, and online instruction	////	4			
Priori	Pure online instruction	/	1			
Question 2a (iii): Does NUL have an explicit **policy** on use of ICT for educational purposes?						
Open	Not yet	/////	5	No explicit blended learning policy.		
Open	Not sure	/	1			
Question 2a (i) **Advocacy** – Who is driving/promoting blended learning initiatives at NUL?						
Open	NUL Management	/	1	Different perceptions regarding driver of blended learning advocacy at NUL.	Individual NUL units, key administrators and IT experts informally advocate.	Stage 1 Awareness and exploration of blended learning
Open	IEMS	/	1			
Open	Faculty of Science and Technology (MACS)	/	1			
Open	Vice-Chancellor, CTL	/	1			
Open	Vice-Chancellor, Pro-Vice-Chancellor, MACS	/	1			
Open	Not sure	/	1			

CODE TYPE	CODE (Subcategories, Kvale, 1996, p.197)	TALLY	TOTAL	CATEGORIES (Main dimensions, Kvale, 1996, p.197)	EMERGING THEME	BL ADOPTION STAGE
Question 3 (a): What **infrastructure** is in place for adoption of blended learning in NUL part-time/ODL programmes?						
Priori	Computers (desktop and laptop)	///	3	Basic infrastructure to anchor blended learning implementation in place, but not sufficient for all NUL programmes.	Infrastructure not expanded to accommodate blended learning across NUL programmes.	Stage 1 Awareness and exploration of blended learning.
Priori	Internet (Bandwidth and Speed)	//	2			
Priori	Classroom space - but insufficient at IEMS*	//	2			
Open	Computer labs - but IEMS lab dysfunctional and not adequate for pedagogic needs of the Institute*	//	2			
Open	Not known	//	2			
Open	Intranet (THUTO)	/	1			
Open	Digital library services	//	2			
Open	Photocopiers	/	1			
Open	PowerPoint projectors (fixed and mobile)	/	1			
Question 3 (d): What **additional technical infrastructure**, if any, is needed to support blended learning at NUL?						
Open	Up-to-date magnifiers, braille, Wi-Fi in student residences	/	1	Existing technical infrastructure not known, pending ongoing inventory; the identified additional technical infrastructure, however, suggests inadequacy.		
Open	Physical space.	/	1			
Open	Not known – an inventory awaited.	/	1			
Open	Satellite (VSAT – Very Small Aperture Terminal) but it is very expensive	/	1			
Open	Network infrastructure	/	1			
Open	Teleconferencing facility	//	2			
Open	Computer labs	//	2			
Open	None	//	2			
Question 3 (b): What **professional development mechanisms** are in place to assist tutors **to design blended learning courses**?						
Priori	Instructional design for blended learning courses	-	-	Training on use of THUTO, and e-Learning. Blended learning instructional design not mentioned.	No instructional design process in place to help faculty to design	Stage 1
Priori	Online training	-	-			
Priori	Seminars – main campus only	///	3			
Priori	Short courses (1 day – 1 week)	//	2			
Priori	One-on-one training	-	-			

Open	Workshops	/	1		blended learning courses.	Awareness and exploration of blended learning.
Open	Not yet in place	//	2			
Open	Not known	/	1			
Open	Six-month training on e-Learning	/	1			
CODE TYPE	**CODE** (Subcategories, Kvale, 1996, p.197)	**TALLY**	**TOTAL**	**CATEGORIES** (Main dimensions, Kvale, 1996, p.197)	**EMERGING THEME**	**BL ADOPTION STAGE**
Question 4 (a): Is there an institutional **ICT management support structure in place** for adoption of blended learning at NUL?						
Open	Limited support - mostly on the main NUL campus*	/	1	Support to blended learning innovations at NUL was neither structured nor formalised.	Inadequate technical and pedagogical support for blended learning adopters.	Stage 1 Awareness and exploration of blended learning.
Open	Yes (ICT management structure comprising Computer Services Unit - CSU; and Designers of 'THUTO' (MACS).	///	3			
Open	No	/	1			
Open	CSU Helpdesk (Main campus and IEMS)	//	2			
Open	Training sessions	/	1			
Question 4b (iii): What **technical or pedagogical support is available for tutors** who will decide to adopt blended learning at NUL?						
Priori	Walk-in	//	2	Technical support was mostly offered through drop-in and landline telephone calls but it is not yet formalised.		
Priori	Telephone	//	2			
Priori	Instant messaging	-	-			
Priori	email	/	1			
Open	Online	/	1			
Open	Not yet in place	/	1			
Question 4b (i): What is the primary way in which early adopters/**tutors can receive technical and pedagogical support**?						
Priori	Walk-in	///	3	An addition of mobile phone use to the existing technical and pedagogical support mechanisms; increased use of email.		
Priori	Telephone (landline)	//	2			
Open	Mobile phone – free calls	/	1			
Priori	Instant messaging	-	-			
Priori	email	//	2			

CODE TYPE	CODE (Subcategories, Kvale, 1996, p.197)	TALLY	TOTAL			
Question 4c (ii): What **support is available for learners** enrolled in courses transitioning to blended learning?					Inadequate support for learners.	**Stage 1** Awareness and exploration of blended learning.
Open	Not sure	/	1	Inadequate support for NUL learners in courses or programmes that may adopt blended learning.		
Open	Computers with internet in library – about 2 or 3 in IEMS library*	/	1			
Open	Digital scanners and photocopiers	/	1			
Open	Training on use of THUTO – main campus only	/	1			
Open	Computer literacy courses – main campus only	//	2			
Open	None (learners use own resources where possible)	/	1			
Question 4c (i): What **support is needed** for learners enrolled in courses transitioning to blended learning?						
Open	Basic instructional technology skills (including digital library skills)	///	3	Induction to instructional technology; extended digital library services that include inter-library services; improved ICT infrastructure and support services (i.e. networked computer labs and libraries with increased physical access and qualified IT technical professionals or assistants); Assistive technology devices for learners with disabilities; and physical library space.		
Open	E-book readers (including, talking books/computers)	/	1			
Open	Infrastructure	/	1			
Open	Day-to-day technical support in computer lab by qualified personnel.	//	2			
Open	Networked computer labs, accessible to learners in terms of opening times.	//	2			
Open	Additional training to support computer literacy courses	/	1			

Table 13: A themes development table of NUL ICT strategy, structure, and support.

***Specific to IEMS*.**

Emerging themes therefore indicated that NUL was at the first stage of the blended learning framework adapted from Graham, Woodfield and Harrison (2013). In addition, it emerged from participants' responses that ICT resources were even more limited at IEMS.

Informed by the framework for institutional adoption and implementation of blended learning adapted from (Graham, Woodfield and Harrison, 2013), Table 14 presents a joint display of the results of this parallel convergent mixed methods research design (Creswell, 2014). Central to these findings are the following markers: ICT strategy, structure, support and technology experiences of tutors and learners.

National Level		
Markers and *Indicators*	**Emerging theme**	**Blended learning adoption stage**
Strategy		
Lesotho ICT and education policies	No uniform definition of ICT-related subjects; no Education policy.	**Stage 1** Awareness/ exploration
Structure		
National ICT infrastructure in Lesotho	Infrastructure developed to accommodate ICT-related subjects.	**Stage 2** Adoption/early implementation
Support		
Government or national authorities' ICT support to educational institutions	Inadequate support for adopters of ICT in Lesotho secondary school education	**Stage 1** Awareness/ exploration

Institutional Level		
Markers and *Indicators*	**Emerging theme**	**Blended learning adoption stage**
Strategy		
Purpose	Individual administrators and IT specialists identify specific blended learning benefits.	Stage 1 Awareness/ exploration
Advocacy	Individual NUL units, key administrators and IT experts informally advocate.	Stage 1 Awareness/ exploration
BL definition	No uniform definition of blended learning; no policy in place.	Stage 1 Awareness/ exploration
Structure		
Infrastructure	Infrastructure not expanded to accommodate blended learning across NUL programmes.	Stage 1 Awareness/ exploration
Professional development	No instructional design process in place to help faculty to design blended learning courses.	Stage 1 Awareness/ exploration

Support		
Technical and pedagogical support	Inadequate technical and pedagogical support for blended learning adopters.	Stage 1 Awareness/ exploration
Course design level		
Faculty		
Technology access (off campus)	Improved technology access for BL adopters.	Stage 2 Adoption/early implementation
Technological, pedagogical, content knowledge (TPACK)	Limited technological, pedagogical content knowledge (TPACK)	Stage 1 Awareness/ exploration
Learners		
Technology access (off campus)	Improved technology access for BL adopters.	Stage 2 Adoption/early implementation
Digital literacy	Limited digital literacy to participate in BL	Stage 1 Awareness/ exploration

Table 14: Joint display of AR Cycle 1 findings guided by Graham, Woodfield and Harrison's (2013) blended learning adoption framework adapted to this study.

4.2 Research Question Two

Drawing on the TPACK framework (Mishra and Koehler, 2006), Salmon's (2002) Five-Stage Framework and technology adoption studies in developing countries (Kihoza *et al.*, 2016; Ifinedo, Saarela and Hamalanen, 2019), the focus of RQ.2 was on technological knowledge of the tutors and prior technology experience of the learners. Using the technology experience questionnaire adapted from Kennedy et al. (2007) and Thinyane (2010), the findings are presented under the two markers added to the original blended learning adoption framework, namely, the tutors and learners (see Table 3). The results are presented in two sub-sections, namely, prior technology experience of the tutors and prior technology experience of the learners.

4.2.1 Technological knowledge of tutors

The tutors were asked about their access to computers at home and at work. In this context, the word 'work' referred to any workplace, given that the majority of the tutors were engaged on a part-time basis in NUL programmes. The responses to the tutors' access to technology outside the IEMS campus (i.e. off-campus) were as shown in Figure 24. The study finds that a mobile phone was the most accessible technology to the tutors, with 28 out of 30 tutors (93%) having access to it and that Wifi was accessible only to 12 out of 30 (40%) off-campus tutors.

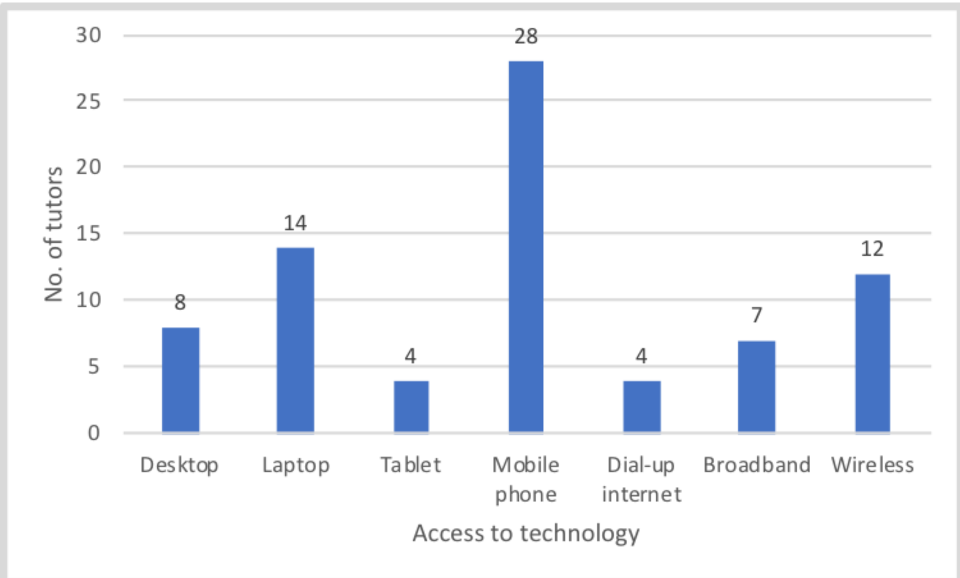

Figure 24: Tutors' access to technology ICT off-campus.

On a Likert-like scale with a list of different ways in which ICTs could generally be used (social, economic, academic), tutors were asked to indicate, on average, the frequency of their use of different technologies and to rate their skills. The skills were rated on a scale of 1–5, where 1 = very low and 5 = very high. The findings are as displayed in Table 15. Some (2) of the respondents who do not use any technologies in teaching and learning went further to mention *"unavailability of resources"* and *"IEMS has no such facilities"*. Lack of institutional ICT resources could therefore be recognised as one of the potential deterrents to the use of technology.

Technology type/use	Skill rating					Total no. used	Not used	Not rated	Total
	1	**2**	**3**	**4**	**5**				
M-phone call	0	0	2	2	19	23	7	0	30
M-phone text/SMS	0	0	2	1	17	20	8	2	30
M-phone video call	4	0	1	1	3	9	2	19	30
M-phone Web search	2	0	1	5	8	16	4	10	30
M-phone email	5	0	1	1	9	16	3	11	30
M-phone web phone call (e.g. Skype)	3	3	1	1	1	9	3	18	30
Computer - typing	1	0	2	0	18	21	6	3	30
Computer - spreadsheet	1	1	4	2	12	20	5	5	30
Computer - presentation	5	3	1	2	7	18	6	6	30
Computer – LMS	2	1	3	1	3	10	6	14	30

Table 15: Technology skills self-rating by tutors.

The tutors felt highly skilled in making and receiving mobile phone calls (63%) and texts (57%) as well as using computers to type or develop spread sheets (see Table 15). However, the needed skills to facilitate the intended blended distance learning pedagogy (Internet access through computers or mobile phones and use of LMS) were rated very high by a small percentage of tutors. For instance, 27% of the tutors rated their prior experience of web search for learning resources very high, sending and receiving email on mobile phones high (30%), while only 10% felt highly skilled on the use of LMS. Similarly, the highest skills related to the use of computers were mostly typing (60%) and spreadsheets (40%). The necessary online learning (web-based) skills were therefore lacking.

The closed-ended questionnaire comprised open-ended questions regarding technologies or technology-based activities that tutors supported teaching and learning with. The findings presented in Table 16 show that email is the mostly used tool (by 43% of the tutors) to facilitate teaching and learning while 40% does not use any form of technology due to the lack of or limited ICT skills or resources.

Use of technology in teaching and learning	No. of tutors	%
Email	13	43
None	12	40
PowerPoint	11	37
Discussion lists/online forums	1	3
MP3 audio-recordings	1	3
videos	1	3

CD-ROMs	1	3
Social networks	1	3

Table 16: Prior use of technology in teaching and learning by tutor.

The next section presents the findings on prior technology experiences of the learners.

4.2.2 Prior technology experience of learners

Given the importance of understanding learner-profiles in any pedagogic review (Beetham and Sharpe, 2007), data on the technology experiences of the learners were collected through similar closed-ended questionnaires to those of the tutors. The learners were asked whether they had access to technology on campus and to indicate its accessible type(s), if any. While it could be assumed that full-time workplaces of part-time tutors could offer alternative access to ICT resources, not all the learners were employed. Focusing on access to technologies in terms of availability and affordability on the IEMS campus as well as off-campus, the responses of the learners were as shown in Table 17. As reflected in the findings, 48% of the learners indicated that they had access to ICT on the IEMS campus. In this context, the access mostly referred to the connection of the University Wi-Fi, using their personal devices such as mobile phones, iPads and laptops.

Participants' response	Number of participants	Percentage
Yes	92	48%
No	84	44%
Sometimes	1	1%
Not sure	5	3%
Not answered	8	4%
Total	190	100%

Table 17: ICT access to the learners on IEMS campus.

Similar to the tutors, the learners were further asked to indicate their level of access to different types of technology off-campus. Table 18 reflects the outcome.

Type of Technology	Exclusive access	Shared access	Limited or inconvenient access	No access	Not sure/not answered	Total
Mobile phone	156	19	1	1	13	190
Mobile phone with a camera	152	18	2	6	12	190
Mobile phone with an MP3 player	122	13	2	21	32	190
Tablet pc (e.g. iPad)	7	4	4	136	39	190
Portable computer (i.e. laptop or notebook)	59	27	13	66	25	190
Desktop computer	33	36	16	81	24	190
Wireless internet access	43	26	27	49	45	190
Dial-up internet access	29	10	12	76	63	190
Broadband internet access (ADSL or cable)	18	14	11	82	65	190

Table 18: Learner access to technology off-campus.

These findings from the data collected through the focus group interview are different from those which were elicited through the questionnaires. The participants in the focus group interview (19) were asked to mention accessible technologies to them, rather than a tick list of deductive responses. This was not only done to “elicit a wide range of views and perspectives” but also to harness the “consciousness-raising effect” of focus groups (Braun and Clarke, 2013, p.110 - 111). Accessible technologies within the context of the learners (in terms of availability) which were not included in the deductive list could therefore be brought up. The suggested technologies were mobile phones, with or without the internet, laptop, and desktop computers. For each identified technology and internet sources, a head count was done to quantify the results for triangulation with quantitative data collected through close-ended questionnaire. Results are shown in Table 19.

<table>
<tr><th rowspan="2">Type of technology</th><th colspan="2">Participants</th><th rowspan="2">Category</th><th rowspan="2">Emerging theme</th><th rowspan="2">BL adoption stage</th></tr>
<tr><th>No.</th><th>%</th></tr>
<tr><td>Mobile phones</td><td>19</td><td>100</td><td rowspan="6">Mobile phones with internet were accessible to at least 14 of the 19 participants (74%), using mobile phone data, including those in rural and remote areas.</td><td rowspan="6">Improved technology access to support blended learning.</td><td rowspan="6">2</td></tr>
<tr><td>Laptop</td><td>4</td><td>21</td></tr>
<tr><td>Wi-Fi</td><td>11</td><td>58</td></tr>
<tr><td>Tablet</td><td>0</td><td>0</td></tr>
<tr><td>Phone mobile data</td><td>14</td><td>74</td></tr>
<tr><td>Modem</td><td>3</td><td>16</td></tr>
</table>

Table 19: Accessible technologies to 19 focus group interview participants.

Some participants also reveal that they access internet across devices through tethering and portable hotspot as well as the use of Internet cafes. However, internet cafes were viewed as widely spread across the districts of Lesotho, but mainly at city centres. In addition, the internet cafes were said to be affordable but unreliable since the systems were mostly down. A further discussion among the participants brought up important aspects, such as, alternative ways to charge mobile phones in rural and remote areas without electricity. These included use of generators, solar power, and use of a car battery which was said to be comparatively the most reliable.

In addition, it emerged from the focus group discussion that in some rural and remote villages, households with electricity charged phones for their communities at a fee, even though queues were usually long. In other settings, the villagers contribute money to facilitate travel of one member to the nearest town to charge mobile phones on their behalf.

The learners were also asked to rate their frequency of use and skills or competencies on the use of different technologies. The findings from the data colleced from the first year learners in the Diploma in Adult Education programme are presented separately from those of Degree fourth Year learners for purposes of comparison of the outcome. The findings are presented in the next section.

Skills - ICT skills of learners

The use of technology by Diploma and Degree learners were analysed separately to establish whether there were any notable differences between the two groups. I perceived such data as a rich resource from which useful lessons could be learned. For example, if any of the groups turned out to be more skilled than the other, contextual uses of mobile phones and other mobile devices could be learned from the findings. The skills were rated on a scale of 1–5, where 1 = very low and 5 = very high. Results findings from the two groups are shown in Tables 20 and Table 21.

Technology type/use	**Skill rating**					**Total no. used**	**Not used**	**Not rated**	**Total**
	1	**2**	**3**	**4**	**5**				
M-phone call	1	5	22	17	51	96	21	1	118
M-phone text/SMS	2	6	13	8	63	92	21	5	118
M-phone video call	12	4	5	5	10	36	4	78	118
M-phone Web info. access	11	6	19	24	27	87	11	20	118
M-phone email	16	12	7	9	12	56	6	56	118
M-phone web phone call	14	2	2	1	2	21	1	96	118
Computer - typing	13	7	14	12	19	65	9	44	118
Computer - spreadsheet	9	9	8	7	13	46	8	64	118
Computer - presentation	15	7	5	6	9	42	3	73	118
Computer - LMS	13	2	12	7	6	40	2	76	118

Table20: Technology skills self-rating by diploma students.

Technology type/use	Skills rating					Not used	Not rated	Total
	1	**2**	**3**	**4**	**5**			
M-phone call	0	0	5	6	57	4	0	72
M-phone text/SMS	0	0	5	6	56	5	0	72
M-phone video call	6	2	10	2	10	4	38	72
M-phone Web info. access	3	2	4	12	33	5	13	72
M-phone email	5	0	6	6	30	2	23	72
M-phone web phone call (e.g. Skype)	7	1	3	1	4	1	55	72
Computer - typing	3	3	9	6	36	10	5	72
Computer - spreadsheet	4	5	3	5	28	6	21	72
Computer - presentation	4	5	8	3	11	4	37	72
Computer - LMS	4	2	7	1	6	2	50	72

Table 21: Technology skills self-rating by degree students.

Given the accessibility of mobile phones to 93% of the tutors and 93% of the participants in this study, a closer look at their prior experience of accessing the web through the device reveals that the majority of the participants have the experience. For example 87 out of 118 (74%) Diploma students (see Table 20) and 33 out of 72 (46%) Degree students (see Table 21) as well as 53% (16 out of 30) of the tutors (see Table 15) could access the web through their mobile phones.

However, the learners who rated their skills to access the web as very high (5) were in the minority, with 31% of them being Diploma students (27 out of 87) and 33% being Degree students (18 out of 54). A higher number, 50% of the tutors (8 out of 16) ranked their skills as very high. These findings therefore suggested that there was no marked difference between prior technology experience of diploma and degree learners at IEMS, as well as tutors with regard to the use of mobile phones to access the web. Furthermore, even though more tutors than learners felt confident with their ability to access the web, there was a need to enhance the skills of the tutors and the learners across IEMS departments.

With the aim to pilot blended distance learning in the context of NUL, the amended plan entailed an induction of the tutors and learners to online instruction. In view of the limited technology experience and support evidenced in AR Cycle 1, the first spin-off cycle (SO Cycle 1) of this AR was conducted for a deeper insight to the technology experience of the learners (see Figure 17). Different from the AR Cycle 1 which was addressed through a baseline survey of three of Davis' (2018) three levels of the ecosphere (i.e. the national, institutional, and course level), from this stage the course level became central to this AR. Hence, the reduced population size from 2327 learners and 177 tutors on IEMS campus to 146 learners taking Course AED270 in 2014/15 and their 3 tutors (see Table 7 in Chapter 3).

The learners were asked to indicate whether they had used any type of technology for their learning purposes; if they had, they were asked 'what' technology and 'how' it was used. If no technology had been used in teaching and learning, the respondents were asked to provide the reasons why that was the case. The responses are shown in Figure 25.

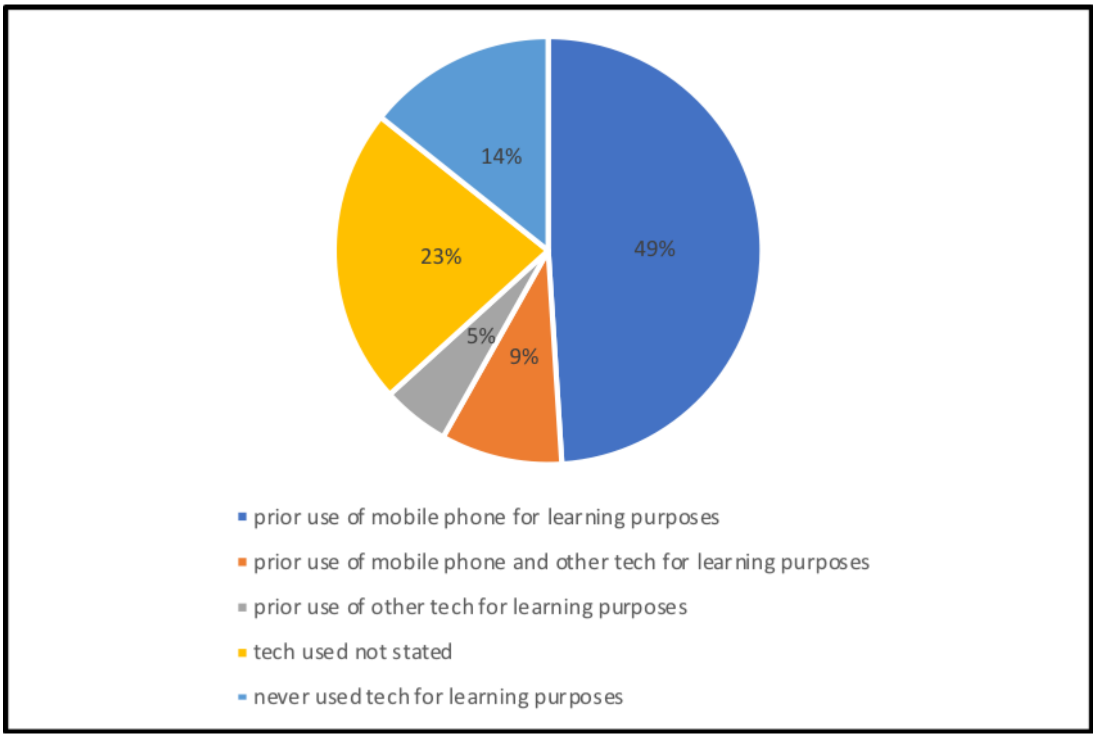

Figure25: Learners' prior use of the technology in teaching and learning.

As shown in **Error! Reference source not found.** 25, the majority of the learners (49%) had used mobile phones for learning purposes; 9% had previously used mobile phones and other technologies such as desktop or laptop computers or tablets; 23% had used other technologies but not a mobile phone; while 5% did not indicate the type of technology they had experience of. However, 14% of the respondents showed that they had never used any form of technology in teaching and learning. Based on these findings, 86% of the respondents taking Course AED270 had prior experience of the use of technology for learning purposes.

Specific use of the identified technologies included communication with peers on social networks (particularly, WhatsApp), phone calls, email and search for study-related material mainly on Google. Only one of the 98 participants mentioned prior experience of audio and video recording of educational content while another one stated that they had previously used ‘Thuto’ in assignments of course AED255 (communication and computer skills course). Notably, this was the only learner that reported prior use of ‘Thuto’ out of 98. The TPACK of tutors was further explored, as discussed in the next section.

4.3 Research Question Three

With the limited technological knowledge (TK) of the tutors, as evidenced in AR Cycle 1 of this study and guided by the notion that existing pedagogy should inform new pedagogy (Beetham and Sharpe, 2007b), a SWOT analysis was conducted to establish the remaining TPACK constructs, namely, pedagogical knowledge (PK) and content knowledge (CK). This required evidence was critical to enhance the tutors’ understanding of the relationship between these constructs.

The analysis was guided by four questions emanating directly from the key elements of the framework, namely, Strengths, Weaknesses, Opportunities and Threats (SWOT). Open-ended questions to facilitate reflection on the course were asked in a manner similar to the following:

Based on your experience in facilitating course AED270, in your opinion, what are the main strengths of the course that should be retained, if the course were to be redesigned? What would be the weaknesses to address? What opportunities exist? What could pose a threat to the success of course redesign?

In your own opinion, is there a need to use technology in teaching and learning in this course? Please justify your answer.

The findings were as shown in Figure 22.

STRENGTHS	WEAKNESSES
Andragogy entailing participatory teaching methods. ODL delivery mode – combination of interactive face-to-face and print-based instruction. Collaborative approaches, e.g. graded written and oral group assignments. Emphasis on higher order thinking skills. Exposure of tutors (full-time and part-time) to training and refresher courses through planning workshops at the beginning of each semester. Team-teaching approach, i.e. collaborative, standardised curriculum review, sharing of learning material, design and development of common tests, assignments (group and individual), and marking memos.	Reluctance of some learners to participate actively in class due to low self-concept. Control of dominant learners in face-to-face discussion without discouraging active participation. The course was more theoretical than practical, thus limiting conceptualization of content by learners. Not all learners had access to learning material, e.g. printed handouts. Performance was poor demonstrated by results of the previous academic year. Out-of-class discussion limited to groups, rather than the entire class. Limited library resources, e.g. current literature. Out-dated course module developed in 1996, and never reviewed due to heavy production costs.
Subject knowledge. Implicit vision of NUL to adopt blended learning. The existing ICT infrastructure (including a dysfunctional computer lab). Ongoing training on use of 'Thuto' by CTL. Participatory and collaborative teaching and learning methods. Availability of mobile phones to tutors and learners. Enthusiasm of all 3 Course AED270 tutors, and learners evidenced by voluntary participation in the study by 67% of the cohort.	Low digital literacy of tutors and learners. Lack of instructional design skills. Challenges associated with national ICT infrastructure, such as lack of electricity, varying internet speed and bandwidth across the country Access to material/content Low remuneration of part-time tutors was likely to discourage participation in blended distance learning developments. Lack of funding for course redesign/review.
OPPORTUNITIES	**THREATS**

Table 22: A SWOT analysis of the existing course AED270 pedagogy.

The outcome of the SWOT analysis in Table 22 evidenced pedagogical knowledge and content knowledge of the tutors. For instance, the course facilitators were aware of a blend of participatory teaching and learning methods and approaches through face-to-face and print-based instruction; they also had knowledge of the subject that they taught. Nevertheless, the lack of technological knowledge was further evidenced. They indicated the need to adopt and implement the use of technology to enhance the existing pedagogy.

Amid their evidenced lack of TK, the tutors provided the following rationale for blended distance learning pedagogy proposed in this study:

To monitor and encourage active participation by all the learners in teaching and learning activities, individually and in groups.

To facilitate open sharing and exchange of information, knowledge and ideas to a larger group (the entire class) outside the classroom, rather than existing practice that limited discussion to the groups of 5 to 10 learners.

Timely online intervention or action by tutors where necessary.

To enhance the existing team approach with ease of communication, and closer interaction and collaboration between the tutors.

To reduce the number of face-to-face sessions in view of costs associated with travel to and from the study centre by the learners across the country.

To reduce the costs of print-based material (e.g. photocopying).

To facilitate access to up-to-date digital resources for the tutors and learners anywhere, anytime.

To enhance digital literacy.

To enhance teaching and learning activities such as issuing assignments online, uploading learning resources, discussion, submission of assignments (group and individual).

To formalise communication and interaction between and among the tutors and learners.

The findings from the SWOT analysis (Table 22), therefore, reiterated not only the need for TK but also the urgency for professional development of the tutors in NUL part-time or ODL programmes, guided by the TPACK framework. Following the findings on prior technology experience of both the tutors and the learners from the first spin-off cycle of this AR. The amended plan for the second AR Cycle (AR Cycle 2) was to induct the tutors and learners about online learning.

4.4 Research Question Four

Central to RQ.4 was to determine a contextually sensitive blended distance learning pedagogic model for NUL. Despite the identified limitations associated with ICT strategies, structures, support and low digital literacy evidenced in the AR Cycle 1 and SO Cycle 1, the feasibility of ICT innovations in Lesotho was also evidenced. For instance, there is a successful and sustained use of technology in three participating secondary schools over the periods exceeding 10 years. Drawing on Salmon's (2002) Five-Stage Framework, therefore, the amended plan for AR Cycle 2 entailed an induction of the tutors and learners to online instruction in two training sessions, with the aim to pilot blended distance learning in the context of NUL.

4.4.1 Induction to online instruction

The induction of the tutors and learners to online instruction was guided by the existing NUL Training Manual for the use of the LMS (Thuto). The prerequisites to facilitate access to 'Thuto' were as follows:

Full registration as NUL student (i.e. financial and academic registration);

A functional personal email account;

Creation of 'Thuto' account.

Central to the induction of the tutors and learners to online instruction were the activities such as training, piloting and evaluating the induction process. Table 23 provides an overview of these key areas and specific data collection instruments for each category of participants. The findings from these data sets are presented under the following sub-headings: the tutors' induction, the learners' induction, the online instruction pilot study and an evaluation of the pilot study.

Key area	Research instrument	Participants
Induction to online instruction (Training sessions).	Field notes; analytics of 'Thuto'; attendance registers.	Tutors and learners.
Online instruction pilot study.	Field notes; analytics of 'Thuto'; attendance registers.	Tutors and Learners.
Evaluation of online instruction pilot.	Open-ended questionnaires; Focus group.	Learners.
	Semi-structured interviews.	Tutors.

Table 23: A summary of data sets analysed to inform a contextually relevant blended distance learning pedagogic model for NUL.

Tutors' induction

Out of the three facilitators participating in this study, two provided the required functional email addresses and could therefore access the LMS. I was also a participant-as-observer (Saunders, Lewis and Thornhill, 2012) in these sessions. All the participants were introduced to the use of pedagogic tools such as *assignments*, *announcements*, *resources* and *email*.

Learners' induction

Prior to the training, as the learners voluntarily registered to participate, it emerged that some of the email addresses provided by the learners were dysfunctional. Given that it was not possible to contact the learners outside their scheduled face-to-face session, the researcher and the training facilitator could only anticipate the problems related to email addresses. Progress in training a sample of 96 out of the 146 (66%) learners in all 3 groups in Training Session One (TS1) and TS2 was as shown in Table 24.

Training Session (TS)	Total no. of participants	No. of learners with functional email accounts (%)	No. of learners without functional email accounts
1	96	48 (50%)	48 (50%)
2	108	80 (74%)	28 (26%)

Table 24: Training progress measured through creation of email accounts in TS1 and TS2 by learners in all 3 groups (X, Y, Z).

Following TS1, the findings that 50% of the participants did not have the required functional email accounts to facilitate access and training on the use of 'Thuto' necessitated a second spin-off cycle (SO Cycle 2) of this AR. The aim of the spin-off cycle was to support the participants in between the scheduled training sessions, mostly to create email addresses and 'Thuto' accounts, or any other help required by the learners. In agreement with the learners, I availed myself to offer one-on-one or group drop-in sessions. During the two-week period, a total of 19 learners dropped-in or made appointments for assistance predominantly with the creation of passwords, change of passwords that had been then forgotten, checking email on desktop computers or their mobile phones and the general practice of newly acquired computer skills.

Of particular interest was the evidence that the learners with limited skills were more free to learn, practice, and express themselves than they were in larger groups. For instance, one of the learners informally and spontaneously remarked "Hei … computer e thata…! … Computer e thata … feela ho monate!" meaning computers are so complex … but this is enjoyable (TS2L-07). In further probing the enjoyment felt in using computers, the participants responded "Tsebo! … e tlo re thusa le ha re batla mosebetsi" meaning, the knowledge will enhance their employability. Nonetheless, low self-confidence in the use of technology was evidenced by statements such as "…. *Rea itšabella* …" (TSL1-07) meaning, 'we lack confidence'.

By the second training session (TS2) the total number of participants increased from 96 to 108 (see Table 24). More importantly, despite the increased participation, the number of participants without functional email accounts had dropped from 50% (48 out of 96) to 26% (28 out of 108). The increase could be attributed to the drop-in sessions introduced after TS1, support from study groups embedded in the existing pedagogy and personal interest in the use of technology motivated by, among others, the quest for knowledge and enhancement of employability skills mentioned by (TSL1-07).

At the end of TS2, it emerged that 28% of the learners still did not have functional email accounts to access and use 'Thuto' (see Table 24). Furthermore, the aim to introduce the learners to the functions of the LMS had not been achieved due to the unanticipated need to train the learners to create email addresses. This outcome necessitated a third training session (TS3) constituting a third spin-off cycle (SO Cycle 3) to facilitate access and use of the LMS by all the participants. There is a need to further induct the learners to the use of the LMS.

Training Session Three

Different from the first 2 sessions, while participants took turns on shared desktop computers, more learners worked either with minimal assistance from peers or independently. Increased confidence was also evidenced by the ability of more participants to work or practice in full view of peers than in previous sessions where participants would not "risk public failure" (Graham, 2007, p.236). However, the learners requiring assistance with email and access to 'Thuto' continued to seek help from peers or the facilitator.

Owing to the rights of the respondents to voluntary participation and withdrawal, among others, the samples across the training sessions varied. While my initial approach was to draw the statistics of attendance from the analytics of 'Thuto', in checking the statistics against the attendance registers per training session (1, 2, and 3) per group (i.e. X, Y, and Z), it became apparent that not all attendees accessed the LMS. This implied that the analytics did not depict accurate statistics of participation in the study. It only depicted those who accessed the system. Analytics of 'Thuto' and the data collected through the attendance registers were therefore triangulated to inform sample sizes presented in Table 25.

Total population per Course AED270 per group		**Training session attendance per group**			**Average attendance**
		TS1	TS2	TS3	
A	58	*37*	*34*	*35*	35
B	40	*30*	*31*	*20*	27
C	48	*29*	*43*	*38*	37
Total sample	146	*96*	*108*	*93*	99
Attended but not accessed 'Thuto'.					
All 3 groups	146	39	27	43	36
Grand Total pop.	146	135	135	136	135

Table 25: Statistics of samples across three training sessions of learners.

Summary of the online instruction pilot results

Following Salmon's (2002) Five-stage Framework, the amended plan for AR Cycle 2 entailed an induction of the tutors and learners to online instruction in two training sessions. In the case of the tutors, the plan was achieved. With regard to the learners, the challenges of access to 'Thuto' necessitated two spin-off cyles (i.e. SO Cycle 2 and SO Cycle 3). By the end of SO Cycle 3, the amended plan for the third Action Research Cycle (AR Cyle 3) of this study was to implement the online instruction pilot study, discussed in the next section.

4.4.2 The online instruction pilot study

Following the induction to online instruction was the pilot study of online engagement by the learners. The proposed blended learning course module template adapted from COL (see Appendix 11) was uploaded to 'Thuto' to facilitate online engagement. Statistics of participation during the 4-week online instruction pilot were as shown in Figure 26.

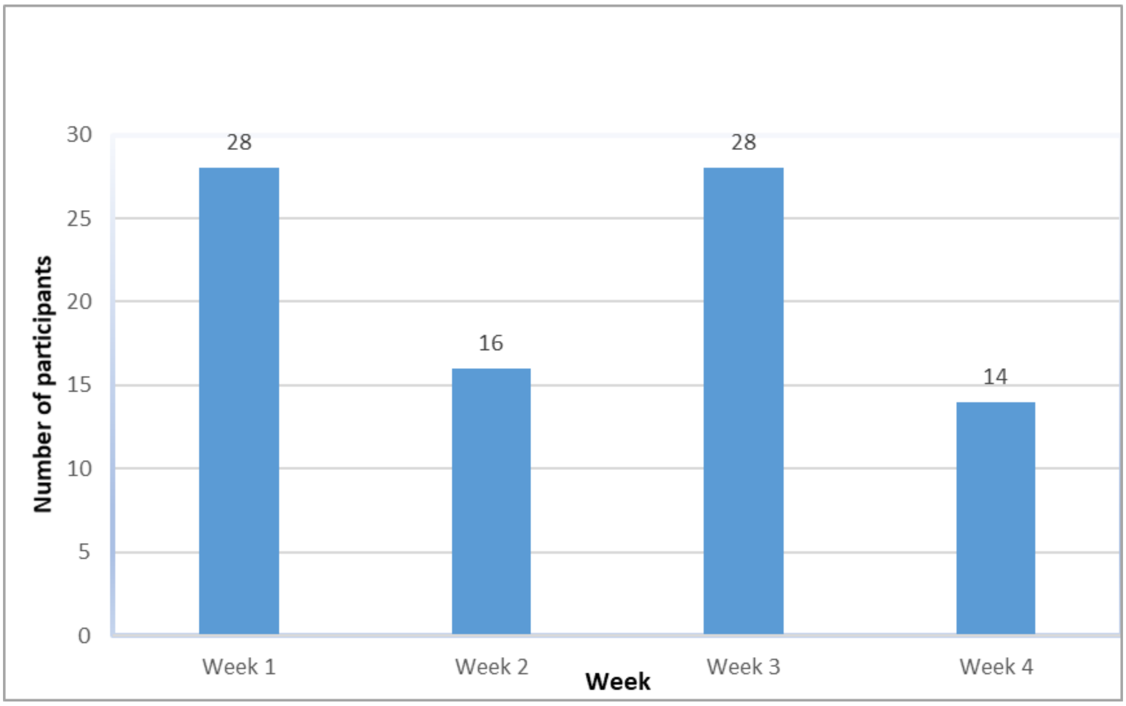

Figure 26: Weekly participation in online engagement pilot by online learners across all 3 groups.

Week One

As illustrated in Figure 26, in the first week of the pilot test (Week 1) low participation was observed. Out of the anticipated average sample of 136 learners trained in TS3 (see Table 25), only 28 (21%) engaged online. Each participant was treated as unique and counted once, regardless of the number of the return visits. While behavioural engagement (i.e. persistence indicated by frequency of return visits to the site) was central to this online instruction pilot, at this stage the focus was more on usability and accessibility of 'Thuto' off-campus, using devices which include smartphones.

It was also arguable that participation by at least nine (9) learners was hindered by inadequate skills to use the features of 'Thuto' (the 2 learners that sought help to access *forums tool*, and 5 that requested additional support and practice) or technical challenges (the 2 learners that sought assistance with creation of passwords). Regardless of the 21% online participation that seemed lower than I had anticipated, accessibility and usability of 'Thuto' by the adult distance learners, off-campus was evidenced.

At this stage, the main activity of participants was to view the unit uploaded to the resources tool. However, two online learners posted the following messages to the chat tool: "Hi everybody, I'm with you in this chart [sic]" and "I'm in forum. I don't see [the] option of writing answers, please help".

In response to the chat by the two learners, I welcomed them online and congratulated them for having successfully accessed the Chat room tool. In addition, I explained the procedure and asked them to get back to me in the event that they continued to experience some challenges. The chats also alerted me to the need to provide all the learners with a guideline to use prior to our next scheduled training session. The benefits of 'Thuto' were evidenced at this stage since all the participants on Course AED270 site (i.e. learners across the 3 groups, Course Tutors, the Training Facilitator, and myself) could not only see the message but also access? the guidance which I offered the learner. In this regard, the Training Facilitator could also supplement and complement my response, if necessary. Furthermore, this experience trigerred the idea that the participants required an illustrative guide in hard copy for ease of reference as they practised how to use the LMS on their own. The query also provided a question to consider in building up a frequently asked questions section of the induction training module.

In addition to online behavioural engagement, a group of five online learners voluntarily requested additional support during the week (outside scheduled face-to-face period), seeking further practice on use of the 'Thuto' resources and forums tool. However, two of these learners also needed assistance with the passwords. The statistics of participation by online learners throughout the 4 weeks of online engagement pilot were as shown in Figure 26, followed by reconnaissance.

Week Two

As shown in Figure 26, online participation dropped from 28 online learners in Week 1, to 16. During this period, face-to-face interaction between the researcher and the learners had declined. For instance, training sessions had ended and fewer learners requested additional support and practice for help. Despite the drop in the statistics of the participants, activities by those who accessed the system which included reading and responding to threads on *Forums* tool had increased. Other activities included visits to the *Resources* tool to view the uploaded blended distance learning template, *Chat room*, and *Email*.

Week Three and Week Four

Following the focus group discussion in AR Cycle 3, Figure 26 indicates that there was an increase in online participation from 16 online learners in Week 2 to 28 in Week 3 and a drop to 14 in Week 4. Moreover, a further scrutiny of the participants from 'Thuto' analytics revealed that only 15 of the 28 participants in both weeks were the same. This therefore implies that in Week 1 and Week 3 there were 13 other different participants. Thus, a total of 47 online learners participated in the first 3 weeks of the pilot. The rise in Week 3 could be attributed to the focus group comprising practical activities to identify and resolve some of the challenges identified by the participants.

Notwithstanding the drop in the number of participants in Week 4, a total of 53 unique participants (i.e. each participant counted once) out of 146 (36%)

participated in online instruction pilot in all of the 4 weeks. This implied that 6 more unique online learners participated in the 4th week. These statistics therefore illustrate an increase in the number of participants over the 4 weeks, from 28 to almost twice the number, i.e. 53. A further breakdown of participation per week showed that from this total of 53 online participants, 22 (42%) participated in only 1 of the 4 weeks, 14 (26%) in 2 weeks; 8 (15%) in 3 weeks; and 9 (17%) participated throughout the 4 weeks (see Figure27). In addition, while 42% participated in only 1 week, the remaining majority of 58% participated in at least 2 weeks.

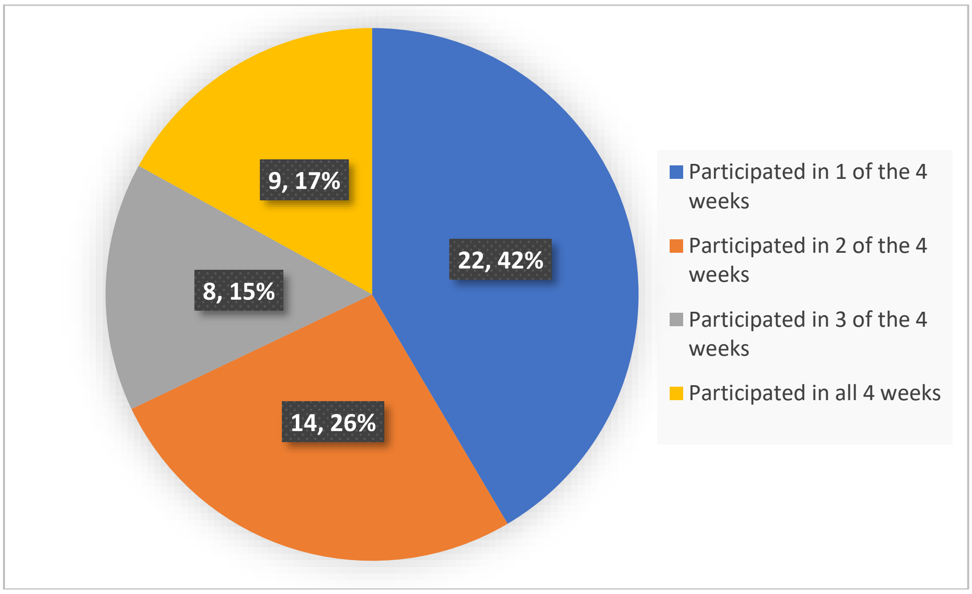

Figure 27: Statistics of participation in the online instruction pilot per week.

In line with Salmon's (2002) Five-Stage Framework adapted to this study (see Figure 8) , the mastery of numerous skills by the learners, even though at varying individual paces, was evidenced. Specific to the evidenced skills were the e-tivities associated with Stage 1 of the framework (i.e. access and motivation - setting up the system and accessing it and Stage 2 (i.e. online socialisation (sending and receiving messages).

Notably, 28 learners had also demonstrated sufficient skills to perform tasks related to Stage 3 of the Five-Stage Framework, namely, Information Exchange (Salmon, 2002) in the first week of the pilot. Nonetheless, the training plan was revised to cover only the first two stages (access and motivation and online socialisation) in order to accommodate differences in the pace of the learners' acquisition of the required skills.

Summary of the online instruction pilot study

Owing to the variations in the samples identified as a possible limitation of this study (see Table 7), Figure 28 provides an overview of participation by the learners in Course AED270 across the stages of AR Cycle 2 (training) and AR Cycle 3 (online instruction pilot). Triangulation of the various data collection tools used across the induction and the pilot study (i.e. attendance registers and analytics of 'Thuto') shows that from the total population of the learners taking Course AED270 in 2014/2015 academic year (146), a total of 136 learners (93%) were voluntarily trained. Nonetheless, evidence from 'Thuto' showed that only 93 of the 136 learners (68%) had accessed the LMS. While 53 of the 136 learners (39%) went further to participate in the online instruction pilot study. Amid the evidenced low digital literacy in the AR Cycle 1 and SO Cycle 1 of this AR, this transition from induction to online participation by the 39% of the learners evidenced stages One and Two of the adapted Salmon's (2002) Five-stage Framework (see Figure 8).

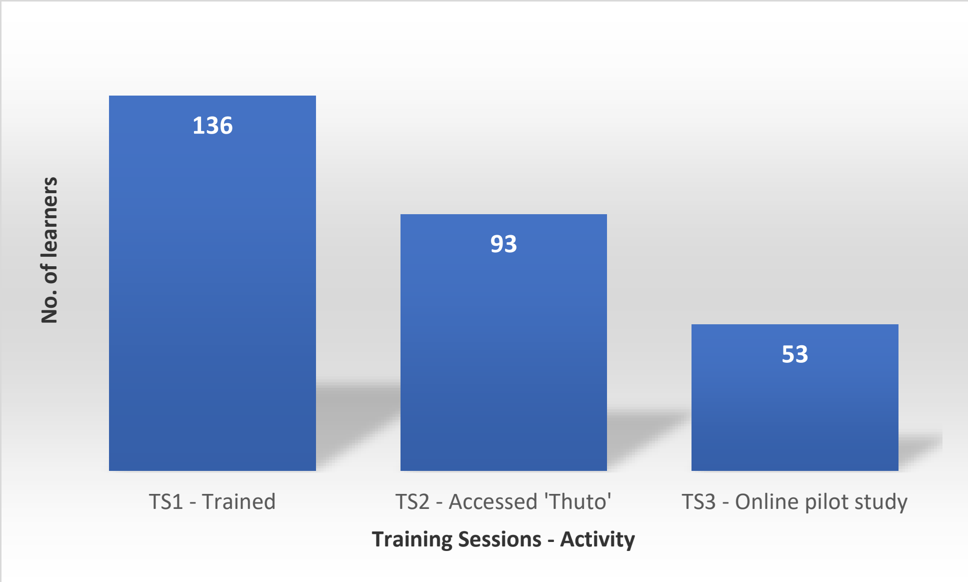

Figure 28: An overview of participation by learners across the stages of AR Cycle 2 (training) and AR Cycle 3 (online instruction pilot).

An evaluation of the online instruction pilot study was conducted to explore the reasons for low or non-participation by the learners and tutors. The results follow.

4.4.3 Evaluation of the pilot study

At the implementation stage of the online instruction pilot study, both an ongoing and a summative evaluation were conducted. Informed by the decline in statistics of online instruction pilot after providing the learners with a step-by-step guide on the procedures to access and use 'Thuto, an evaluation of the reasons for the low participation was conducted. At this stage of the AR where reasons for non-participation in the study was also critical, the population comprised all the learners taking course AED270. Owing to the loss of one of the learners, the total population of the learners had dropped from 146 to 145, while that of the tutors remained at three. A sample of 69 out of 145 learners (48%) participated. This sample included 45 learners who completed open-ended questionnaires and 24 learners who participated in a focus group. In addition, semi-structured interviews with two out of the three tutors were also conducted. The results are presented under each of these three data collection tools.

Learners' open-ended questionnaire

A sample of 45 participants who completed the open-ended questionnaires comprised 8 males, 36 females and 1 undisclosed gender aged between 25 and 44 years, with the majority (49%) aged between 25 to 29 years. The gender imbalance in these statistics could be attributed to the high female population across the educational landscape of Lesotho (LCA, 2017a; LCA, 2016).

The focus of the open-ended questions was on participation or non-participation in online activities, experienced or perceived benefits of blended distance learning, encountered or anticipated challenges, the enabling factors, emotional engagement, the suggestions and recommendations. Table 26 presents the development of themes emerging from the data.

<table>
<tr><th>CODE TYPE</th><th>CODE
(Subcategories, Kvale, 1996, p.197)</th><th>TALLY</th><th>TOTAL</th><th>CATEGORIES
(Main dimensions, Kvale, 1996, p.197)</th><th>THEME</th></tr>
<tr><td colspan="6">Ques. 2.1 (a) If yes, in what way did you participate in online activities on THUTO.</td></tr>
<tr><td>Priori</td><td>Read the uploaded resources.</td><td>///// ///// ///// /////</td><td>20</td><td rowspan="2">Accessed and read uploaded resources and assignments</td><td rowspan="6">Behavioural engagement:

Effort to access Thuto tools, mostly resources, email, forums and chat room, arranged in order of importance.</td></tr>
<tr><td>Open</td><td>Checked assignments.</td><td>/</td><td>1</td></tr>
<tr><td>Priori</td><td>Joined discussion on Forums or Chat room.</td><td>////</td><td>4</td><td>Interaction</td></tr>
<tr><td>Priori</td><td>Read and sent emails.</td><td>///// ///// ///// //</td><td>17</td><td>Communication</td></tr>
<tr><td>Open</td><td>Helped others to log into THUTO.</td><td>/</td><td>1</td><td>Support other learners</td></tr>
<tr><td>Open</td><td>Read general university announcements.</td><td>/</td><td>1</td><td>Access to information</td></tr>
<tr><td colspan="6">Question 2.1 (b) If no, please state your reasons for having not participated</td></tr>
<tr><td>Open</td><td>Unable to access THUTO.</td><td>/</td><td>1</td><td rowspan="4">Unsuccessful attempts to access THUTO</td><td rowspan="7">Challenges:

Technical problems;

Limited ICT skills, and lack of ICT resources.</td></tr>
<tr><td>Open</td><td>Inability to access THUTO using a mobile phone.</td><td>//</td><td>2</td></tr>
<tr><td>Open</td><td>Server problems.</td><td>/</td><td>1</td></tr>
<tr><td>Open</td><td>Email problems.</td><td>/</td><td>1</td></tr>
<tr><td>Open</td><td>No smartphone.</td><td>/</td><td>1</td><td>Lack of own resources (smartphone).</td></tr>
<tr><td>Open</td><td>Lack of computer skills.</td><td>/</td><td>1</td><td rowspan="2">Lack of computer skills.</td></tr>
<tr><td>Open</td><td>“It was not introduced actively since my arrival at the university”.</td><td>/</td><td>1</td></tr>
</table>

Open	Limited time.	/	1	Limited time.	
Question 2.2 - (a) Reflecting on your experience of THUTO, if you perceive benefits/advantages of the use of technology in teaching and learning, please list them in order of priority and elaborate where necessary.					
Priori	Access to information.	///// ///// /////	15	Access to information and resources.	
Open	Access to technology while at school – no smartphone.	//	2		
Open	Submission of assignments online.	/	1		
Priori	Communication with facilitators.	///// ///// /	11	Communication - learner-teacher and learner-learner.	**Emotional engagement**: Influenced by perceived benefits, mainly enhanced digital literacy and reduced costs; Access to information and resources; and ease of communication.
Priori	Communication with other learners or group members.	///// //	7		
Open	Discussion and sharing knowledge and ideas with other learners.	///	3	Interaction - learner-learner and learner-content interaction.	
Open	Enhances interest to participate.	/	1		
Priori	Acquisition or enhancement of computer skills.	///// ///// ///// /////	20	Enhanced digital literacy	
Priori	The possibility to study anytime, anywhere.	///// ///// //	12	Flexibility in teaching and learning.	
Open	Relevance to the needs of adults with limited time.	//	2		
Priori	Reduced travel costs.	///// ///// ////	15	Cost-effectiveness.	
Open	Reduced communication costs.	/////	5		
Question 2.2 (a) Reflecting on your experience of THUTO, if you do not perceive benefits/advantages of the use of technology in teaching and learning, please state the reason why there may not be any benefits or advantages.					
Open	Expenses related to buying data or technological devices.	//	2		**Perceived challenges**:

Open	"Some of us live in rural areas where it is even difficult to charge cell phones and network is a problem".	/	1	High costs of devices and data, and unequal distribution of ICT infrastructure across the country pose a challenge to online engagement.	Availability and affordability of ICT resources and infrastructure.
Question 2.3 (a) Please state the experienced as well as perceived challenges related to the use of THUTO.					
Priori	Low digital literacy/limited knowledge of computer use.	///// ///// /	11	Limited ICT skills/digital literacy	**Challenges**: Lack of/limited ICT skills; Access (on and off campus - limited/lack of ICT resources off-campus and on-campus, including Internet connectivity/network problems.
Priori	Limited time for practice.	///// ///// //	12		
Open	Email account problems.	/	1		
Open	Inability to apply the acquired computer skills to a mobile phone.	/	1		
Priori	Lack of ICT resources off-campus.	///// ///// /	11	Limited access due to inadequate ICT infrastructure and resources off-campus	
Open	Lack of electricity.	//	2		
Priori	Costs associated with internet use.	///// ////	9		
Open	Limited ICT resources on campus.	//	2	Limited ICT resources on campus (e.g. desktop computers and Wifi).	
Priori	Internet connection/ network problems.	///// /	6	Network problems.	
Question 2.3 (b) Please state any enablers (i.e. factors that made it possible for you to use technology in teaching and learning) to the use of THUTO.					
Priori	Availability of ICT resources off-campus.	/	1	Access to ICTs, digital literacy, and learner support were some of the enabling factors.	**Enablers**: Availability of resources; Prior technology experience; Learner-support (peer and institutional support).
Priori	Knowledge/ability to use computers.	//	2		
Priori	Support from other learners.	/	1		
Priori	Support from facilitators/researcher/ instructional technology lecturer/IT manager.	//	2	Institutional learner support.	
Question 2.4 Despite the experienced or perceived challenges, what is your general feeling about the proposed adoption and implementation of Blended Learning (BL) in part-time/ODL programmes of NUL?					
Open	BL is relevant and necessary.	///// ///// ///// //	17	BL is viewed as relevant to the educational needs of the adult learners.	**Emotional engagement**:
Open	Enhances digital literacy/brings development to the lives of the learners.	//	2		

Open	Prefer a combination of print media and online instruction.	///	3	A combination of print media and online instruction is preferred.	BL is relevant to the needs of adult learners in IEMS programmes.
Open	More time for practice is needed.	//	2	Adequate training of the learners is required.	**Enabler**: Adequate training and support of the learners is needed
Open	Enhances communication.	///	3	Enhanced communication and interaction in teaching and learning.	**Emotional engagement**: BL can enhance communication and interaction in teaching and learning; BL can be affordable to the learners at IEMS.
Open	Enhances interaction.	///// /	6		
Open	Easy submission of assignments	//	2		
Open	Promotes motivation to learn.	//	2		
Open	Cheaper in terms of time and money.	////	4	BL can be relatively cheaper in comparison to the existing combination of face-to-face and print media.	
Open	Ease of access	///// /	6		
Open	Feelings not stated	///// ///// /	11	(See Table for further exploration and results).	
Question 2.5 Please write any suggestions/recommendations regarding the proposed BL for the part-time/ODL programmes offered by NUL.					
Open	BL recommended since different instructional methods can accommodate the learners limited access to the ICTs.	///// ///// ///// //	17	Adoption and implementation of BL recommended.	**Emotional engagement**: Adoption and implementation of BL recommended.
Open	BL is recommended because online learning is cheaper (saves time and costs associated with travel to face-to-face session).	///// //	7		
Open	BL is recommended since it brings the use of technology that is relevant to the developmental needs of the learners.	////	4		
Open	Reduction of face-to-face instruction.	/	1		
Open	More time for practice and more access to ICT resources needed.	///// //	7	Adequate training in the use of ICTs and increased access to the learners on campus.	**Recommended enablers**:

Open	More institutional ICT resources (computers and the internet) are needed (in order to promote access to learning resources and information and to accommodate the learners without personal technological resources).	///// //	7	More investment in ICTs by NUL.	Adequate training in the use of ICTs and increased access to the learners on campus. More investment in ICTs by NUL.

Table 26: Themes development table of online learning benefits, challenges, enablers, emotional engagement and recommendations by participants.

The findings of the content analysis (Table 26) were triangulated with analytics of 'Thuto' presented in Figure 29.

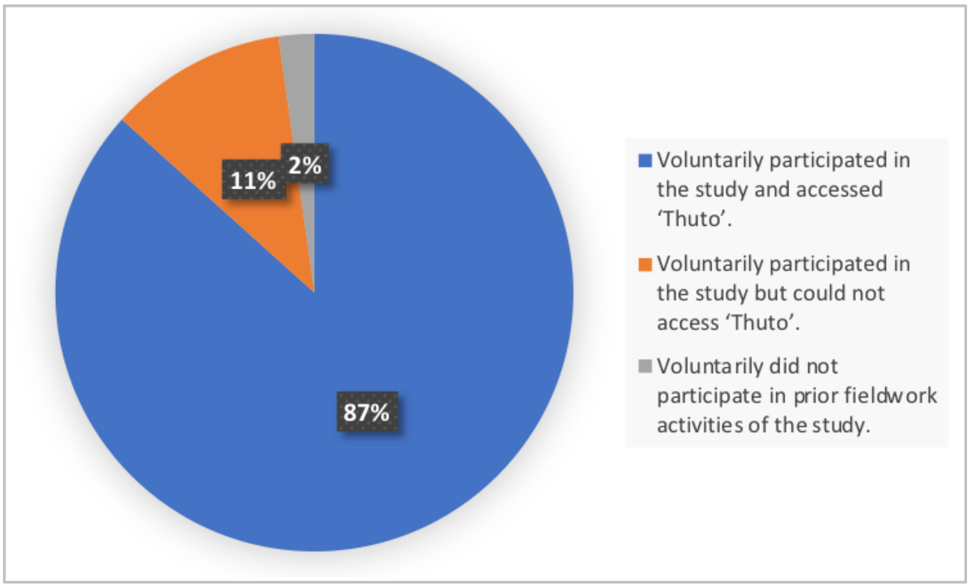

Figure 29: Statistics of participation of respondents in online engagement pilot.

Participation in online activities

As shown in Figure 29, a total of 98% of the respondents (44 out of 45) comprising 87% (39) and 11% (5) voluntarily participated in the study, even though 11% of the sample could not access 'Thuto'. Online activities (Course AED270 site visits) of the 87% that accessed the LMS mostly entailed the use of 5 of the 6 tools introduced to the participants to view or read the uploaded resources, to check assignments, to communicate through email or the chat room, to initiate or respond to the threads on the forums tool. Additionally, one of the 39 respondents stated that they shared knowledge and skills by helping others to use 'Thuto' and another respondent accessed the general NUL information and announcements.

Notwithstanding the site visits by 87% of respondents who completed the open-ended questionnaires, 11% (5) indicated that their effort (Turner et al., 2014) to participate were unsuccessful due to the challenges such as inability to access 'Thuto' using a mobile phone, the use of email, system or server problems, lack of resources (a smartphone) and lack of computer skills.

Excerpts from open-ended questionnaires completed by the respondents who reported unsuccessful attempts to participate are presented in Table 27. Owing to the use of the native language and English concurrently to maximise free expression in the cultural context, the meaning of responses in Sesotho are provided.

Participant ID	Excerpt from open-ended questionnaire
B13	"Ha ke khone ho kena ho THUTO" Meaning: I am unable to access THUTO.
B19	My mobile phone doesn't enable me to participate on THUTO.
B22	It was not easy to access the server and I lack use of computer knowledge.
B37	"I have applied for this THUTO. So, there was difficulty to be enrolled in the system, since the launching of this technology being testing effective functionality of this programme for AED270, but I was willing to take part in this activity. I am still hopeful to participate as soon as I am connected into this system".
B42	"I have not yet gotten my password for THUTO, so it was very difficult to participate".

Table 27: Excerpts from completed open-ended questionnaires indicating unsuccessful attempts to participate online.

In response to the question of experiences or anticipated benefits, challenges, and enablers of online instruction in the context of Lesotho, and in particular NUL, the findings are presented in Table 28, which not only shows the three categories of interest, but also the ranking in terms of the total number of occurrence of deductive and inductive codes, perceived as an indicator of the hierarchy of importance (Drisco and Maschi, 2015) to the learners.

Rank order	**Benefits** Experienced/perceived.	Total	Challenges Experienced/perceived.	Total	Enablers Experienced/perceived.	Total
1	Enhanced digital literacy.	20	Limited digital literacy.	25	Prior technology experience.	2
2	Cost-effectiveness.	20	Limited access due to inadequate ICT infrastructure and resources off-campus.	22	One-on-one support by researcher or training facilitator.	2
3	Access to learning resources and information.	18	Limited time to practice their newly acquired ICT skills.	12	Availability of ICT resources off-campus	1
4	Communication (learner-teacher, and learner-learner).	18	Technical and network problems.	6	Peer support.	1
5	Flexibility in teaching and learning.	14	Limited ICT resources on campus.	2		
6	Interaction and collaboration with other learners.	4	None			
7	None					

Table 28: Hierarchy of benefits, challenges, and enablers of online engagement. identified by participants based on frequency of occurrence.

The rationale for perceived or anticipated benefits was as shown in Table 29.

Participant ID	Excerpt
B29	I consider this model as the best way for the adult learning programme as learners will perform both academic and family duties at the same time
B30	I am not good at technology, so it gives me conflicts cos sometimes, like now, my email address gives me a problem; it says, 'sign in' whose meaning I don't know. I am an adult with responsibilities. I don't have time to study via technology. My email had problems, so I wanted to attend/face the researcher at her spare time, and I did. She helped me.
B37	… I perceive it very fruitful to the adult learners … without moving from one place to another…
B41	I think it's the best way of learning, especially in adult education programme because most of them work.

Table 29: Excerpts from open-ended questionnaire responses linking blended earning to adult learning.

In spite of critical success factors which include the positive attitudes of the learners evidenced in this study; two participants stated that they neither experienced nor anticipated the benefits of the use of technology in NUL part-time/ODL programmes (see **Error! Reference source not found.**). Common to these two p articipants (Participants B19 and B22) was that their perceptions were based on the anticipated challenges informed by prior knowledge and experience, rather than the current experience encountered during the online instruction pilot. Furthermore, their general feelings about BL, suggestions or recommendations contradicted their statements that there were no benefits anticipated from the adoption and implementation of blended learning. For instance, Participant B22 perceived the benefit that “it would be easy to communicate with the tutors and get help in studying with other students” while Participant B19 suggested “We should be given extra time for the online instruction” (see Table 30). These statements indicated the proposed pedagogic model must include enhanced communication and interaction with the tutors and peers and adequate time to enable the mastery (Salmon, 2002) of the required online learning skills, thus, contradicting earlier statements that the learners did not perceive any benefits of blended learning.

ID	Challenges	General feeling about BL	Suggestions/ recommendations
B1	Lack of ICT resources to use when away from IEMS, costs associated with the internet use; and limited time (Priori codes).	"Nna ke utloa e le bohlokoa, ha e ka ea hla ea sebetsa, ea re fa nako e ngata nokong eo re leng ka computer lab re ka e tseba kapa hona ho tseba information e ngata ho tsoa ho eona". Translation: I feel this is important, if it could actually be used, and we are given a lot of time in the computer lab, we can acquire ICT skills and even secure lots of information from it.	I recommend.
B2	Lack of ICT resources to use when away from IEMS; costs associated with the internet use. (Priori codes).	It is valuable, but I think you should offer us more time while in the computer lab for better understanding.	Not stated.
B3	It was very difficult for me to participate on the work we were given because I had to go to school lab to access free internet and another reason is that I don't use mobile phone which can enable me to access or learn online. I had to go to the internet shop to participate. It causes me to pay a lot of money at internet shops because I am taking longer time as I am not used to technology. (Priori codes).	Not stated.	Online learning is more cheaper [sic] as there are Wi-Fi where we can access information free, even though it's available at some certain areas.
B4	There is a limited time for practice; lack of computers. (Priori codes).	Not stated.	We do need e-learning because it reduces time to and from school. And also decreases transport expenses.

B5	Limited time to practice; lack of ICT resources to use when away from IEMS. (Priori codes).	Print media and online instruction.	We need electronic learning because it reduced time to and from school. Also reduces transport expenses.
B6	Though I have literacy skills on computer now I have a problem to log in through my phone. But I think it is advantageous if I buy a mobile phone that will allow me to use THUTO in learning.	Online instruction because I am a part-time student, so this will help me to discuss with my facilitators and my colleagues in advance. So that when we meet in face-to-face we will discuss easily.	A combination of face-to-face and online instruction.
B7	Internet is not reliable; some of us are illiterate in computer. (Priori codes).	It is necessary. We need it, as the world recently depend on technology. It would help us to be familiar with technology.	We would like to be able to access internet all the time, every day of the week.
B8	Lack of ICT resources to use when away from IEMS. (Priori code).	A combination of face-to-face.	Not stated.
B9	Internet connectivity problems and costs associated with the internet use. (Priori codes).	It broadens the knowledge on the use of computers and enables learners to give the instructor the problems they face immediately when the problem occurs.	It should be used in all the courses in order to ease the work and help in the reduction of travel expenses.
B10	No challenges. I have knowledge of using a computer so that did not give me a problem. I can be able to use it and managed to also use THUTO as well as help others to create some google account. The challenge I observed is network problem. (Open code)	It gives me motivation and I encourage others to get used to technology.	I suggest that we use distance learning because it promotes and encourage learners to use technology wisely and everyone can get used to it.
B11	When I am at home costs become too high especially when using tablet. (Priori codes). but on Nokia Asha it does not show or allow me to respond to text. (Open code).	Online instruction is much cheaper as compared to face to face because from Ha-'Anonymised' to Maseru I use R200 for only two days for transport only. So I really appreciate this proposed adoption.	Not stated.

B12	I have little knowledge of computers. (Priori code).	I like it very much because it brings development to my life.	Since technology makes life easy, it is important to us because it Saves our time and it is improvement to us since we deal with technology.

Table 30: A sample of participants who experienced or anticipated challenges but expressed interest or positive affect towards blended learning.

Key:

	Lack of/limited access to ICTs off-campus.
	Network or Internet problems.
	Expensive.
	No challenges experienced.
	Lack of ICTs on IEMS campus.
	Limited skills.
	Cost-effective.
	Personal development.
	Emotional engagement.
	Motivation
	Time constraints.

Perceptions of the learners on the costs associated with blended distance learning were predominantly speculative since none of the participants had prior experience of online learning. Although contradictory statements emerged from different participants, central to the arguments were the comparisons between travel and accommodation costs to these adult distance learners as well as acquisition of personal technology devices and the Internet costs (see Table 31).

Participant ID	Excerpt
B35	Online instruction is the one that can reach us wherever we are, and we can ask questions without coming to the institute.
B39	It is going to be cheaper to do school work; no travel expenses; response from facilitator is faster than face-to-face or submission of assignments.
B19	… it is costly, and we have limited time to practice when we are at IEMS.
B16	It is cheap, more especially that we come from far places. But it is also expensive if one does not have a laptop or smart phone.
B15	But as for transport, it's still the same because I buy data to log onto THUTO because I log on my mobile phone.
B11	When I am at home costs become too high especially when using a tablet. (Priori codes). However, on Nokia Asha it does not show or allow me to respond to the text. Online instruction is cheaper as compared to face-to-face because from Ha-Sekoloto (pseudo geographical area) to Maseru I use R200 (roughly £12) for only two days for transport only. So, I really appreciate this proposed adoption.

Table 31: Learner excerpts of comparisons between face-to-face and online instruction.

The foregoing contradictory accounts (Sapsford and Jupp, 2006) indicate that theeconomic factors were not necessarily key in blended learning decisions made by the learners. This was evidenced by theparticipants' recommendation of blended learning, despite their arguments for or against its cost-effectiveness. The critical factor, therefore, was the value placed on the use of technology, possibly based on the perceived benefits. Equally important would also be the value placed by numerous stakeholders in education, such as policy and decision-makers at national and institutional levels, IT specialists and tutors (full-time and part-time). The next section covers the results from the focus group with the learners.

Learners' focus group

The focus group interview was guided by questions similar to those of the open-ended questionnaires, namely, the experienced/perceived benefits, the experienced/anticipated challenges, the enablers, the general feelings towards blended learning, the suggestions and recommendations. The inhibiting factors identified in the group were similar to those expressed in the open-ended questionnaire. For instance, expressions of discouragement in that *"Most of the resources or information are for the National University of Lesotho. We do not get information about IEMS" (Participant B24*), emerged from the focus group. The Learners stated that most of the announcements on 'Thuto' were related to the 'University', meaning the main NUL campus and not IEMS. These perceptions signified lack of feelings of belongingness to NUL by the learners on the IEMS campus.

Other challenges reported by the respondents who had not participated in the online instruction pilot were their inability to access 'Thuto' through smartphones and lack of IT support off-campus.

Contrary to the findings from open-ended questionnaires, the main benefits and enablers identified in the feedback discussion included lots of time to practice anytime, anywhere, for those who had resources such as smartphones. For instance, one participant argued as follows:

Participant: *"Nako eona ene e le ngata … ke hore … hohle moo u teng …".*
(there was plenty of time … I mean … wherever you are …!).

Researcher: *"Oh! … Nako e ne e se bothata-thata?".*
(Oh! … So, time wasn't really a problem?).

Participant: *"E-e … nako eona e ne e se bothata. Cos ha u qeta mabaka a hao ua oa e etsa. Le ha u ntse u etsa mabaka a hao u … u khona ho kena, u shebe…".*
(Yes … time was not a problem. Because as soon as you have completed other tasks … or even as you carry them out … you are able to access… and see …).

While phrases alluding to the availability of time had occurred less frequently (once) in open-ended questionnaires *"I enjoyed the use of technology. I realised that I could even do it in my spare time to practise" (Participant B45*). Time constraints ranked third in challenges faced by participants (see Table 30).

Further exploration of these different perspectives on time revealed that the respondents to the open-ended questionnaire mostly based their arguments on social and economic responsibilities associated with adulthood and *"… limited time to practice on computers where there is availability of internet and free Wifi"*. This statement implied the reliance on institutional ICT infrastructure and resources, as well as support to practise the use of 'Thuto', while the respondents in the focus group had alluded to exploitation of available personal ICT resources and time. The

Learners with personal technologies, therefore, were more advantaged than those who relied on the limited resources at IEMS to participate online. Thus, underscoring the importance of personal technologies in blended distance learning. Nevertheless, the *motivation* (Salmon, 2002) to engage online was more of an enabler, as indicated by the respondents who exploited every available opportunity, amid the social and economic responsibilities related to adulthood. The findings from the semi-structured interviews of the tutors are presented in the next section.

Semi-structured interviews of tutors

The findings from the thematic analysis of in-depth interview transcripts of the two tutors comprised 'deductive' and 'inductive' categories and themes. This was due to the use of a similar coding frame for content analysis of the learners' open-ended questionnaire data and the thematic analysis of the focus group discussion. Deductive themes therefore consisted of those derived from the reviewed literature in this study and those emanating from the responses of the learners. Inductive categories and themes emerged from the responses of the tutors.

As with the analysis of the learners' open-ended questionnaires and the focus group discussion, the responses of the tutors were categorised into perceived or experienced benefits, the challenges, the enablers; the general feelings about the proposed blended distance learning pedagogy, the suggestions and the recommendations. The findings from the tutors' interview transcripts were categorised into deductive (priori) themes and inductive (open) themes that emerged (see Table 32). These findings are discussed under the following main

RESPONSE FOCUS	DEDUCTIVE CATEGORY	DEDUCTIVE THEME	INDUCTIVE CATEGORY	EMERGING THEME
Experienced or anticipated benefits.	Access to information and resources; Enhanced digital literacy.	Enhanced digital literacy applicable to other workplaces and life in general; reduced travel costs for learners.	Recorded/evidence of tutor-learner pedagogic interaction within the NUL LMS for future reference.	Enhanced pedagogy.
	Enhanced learner-teacher and learner-learner communication and interaction.		Generation of learning resources through approved tutor-learner, and learner-learner discussion on ‘Thuto’ Forums tool.	
	Enhanced digital literacy.		Increased motivation for tutor collaboration in existing pedagogy.	
			Improved performance of tutors.	
Experienced or anticipated challenges.	Time constraints.	Lack of/limited ICT skills and access (on and off campus - limited/lack of ICT resources off-campus and on-campus, internet connectivity.	Unsatisfactory library services for part-time tutors.	Inadequate pedagogic support for part-time tutors.
	Low digital literacy.			
	Limited access due to inadequate ICT infrastructure and resources off-campus			
	Limited ICT resources on campus (e.g. desktop computers and Wi-Fi).			
Enablers.	Access to ICTs.	Availability of resources, prior technology experience.	Learner interest amid limited time and resources.	Feasibility of blended distance learning pedagogy evidenced by identified critical success factors.
	Digital literacy.		Support from local internet service providers.	
			Availability of solar products and power banks for use in areas without electricity.	
			Collaboration of tutors in existing pedagogy.	

RESPONSE FOCUS	DEDUCTIVE CATEGORY	DEDUCTIVE THEME	INDUCTIVE CATEGORY	EMERGING THEME
General feeling about the proposed blended distance learning.	Print-based instruction is essential for Lesotho context.	Proposed NUL blended distance learning pedagogy should comprise print-based instruction.	None.	None.
Suggestions and recommendations.	Adoption and implementation of BL recommended.	Intensified institutional support for adoption and implementation of blended distance learning.	BDL policy development and implementation.	Intensified institutional support for adoption and implementation of blended distance learning.
	Adequate training in use of ICTs and increased access internet access on campus.		Induction of learners to blended distance learning in their first year of study.	
	More investment in ICTs by NUL.		Investigation of how available solar devices can be exploited in areas without electricity in Lesotho.	

Table 32: Thematic analysis of tutors' in-depth interview transcripts.

categories: the perceived or experienced benefits of blended distance learning pedagogy, the anticipated benefits, the enablers;

Perceived or experienced benefits of blended distance learning pedagogy

Emerging themes from the data collected from two tutors entailed both deductive and inductive themes. Common themes on perceived and/experienced benefits of blended distance learning pedagogy to the tutors and learners were: enhanced digital literacy and its cost-effectiveness to the learners. The tutors, however, went further to elaborate that the benefits of enhanced digital literacy spilled over to their workplaces and life in general. For instance, Participant CT01 stated

> "… Joale, ke ne ke re, 'na se nthutile, this study … se nthutile le hore ke tseba ho edita li-documents from the computer. I don't need to print, ebe ke li bea fatše on the hard copy … no, for now ke tseba ho li edita hantle mochining, ebe ke li romela mong'a ka".
>
> *(So, I am saying, I have learned from this study … it has even taught me how to edit documents in soft copy. I don't need to print and get documents down in hard copy … no, for now I know how to edit the documents in soft copy and send to my line manager).*

Different from the learners, additional deductive themes (Drisko and Maschi, 2015) derived from the reviewed literature on the benefits of blended learning that emerged inclused the enhanced pedagogy (Graham, Woodfield and Harrison, 2013) through strengthened collaboration of the tutors, as shown by CT02, for instance.

"Ke utloa eka … aache … ha ke sa na letho. Ntle le hore eona eno … re ne ntse re e bua le *Lineo (pseudo name)… We need to work together! Ke hore ntho eane ea hore u ne u re kopantse mohlang ola … e ne e re fihlele … re le mmoho … e re thusa hore re tsebe ho ea shera … ke hore e tla ba bobebe ho rona. Bana ba rona ba tla ts'oana holistically. Ho tla fapana li individual, ho receiva lintho".

I feel that I do not have anything more to say, except that we had a discussion with Lineo (pseudo name) that we need to work together! I mean, your idea of bringing us together on that day … we realised that it helped us to share … I mean, it will be easy for us. Our learners will be on *the same footing, holistically, other than individual differences in receiving information.*

The respondent therefore maintained that the experience of collaborative design of one Unit for the online instruction pilot in this study, helped the tutors to realise the value of working together. The approach was also recognised for its potential to enhance existing team-teaching practice through consistency of content and delivery methods across different groups of learners in the same course. For example, the learners would be exposed to similar teaching and learning experience in terms of access to teaching and learning resources, teaching methods, activities, and opportunity for interaction with peers and tutors, where necessary, through the adoption of blended learning. Hence, the envisioned increased motivation to collaborate for enhanced performance of the tutors. The challenges identified by the tutors are discussed next.

Anticipated or experienced challenges of blended distance learning pedagogy

Identified challenges mostly aligned with deductive themes derived from the reviewed literature and data collected from learners, namely, time constraints, limited digital literacy, insufficient ICT resources (e.g. electricity and Wi-Fi) off campus, as well as the lack of or inadequate ICT resources on the IEMS campus. Similar to the part-time learners, the identified time constraints were related to social and economic responsibilities, given that both course tutors were employed elsewhere on full-time basis. Both tutors emphasised, with examples, that due to the time factor, they had not been able to participate as meaningfully as they had intended to in the activities of this study.

In addition, the tutors identified the library services as a major challenge to part-time lecturers at IEMS. Both participants shared their experience in trying to borrow some books from the IEMS library

"… we lack teaching resources - I am much discouraged by the NUL library system because sometimes I am told hore "system ha e u tsebe" (meaning: "you are not known to the system") (Participant CT01).

While the essence of the reply was that the system does not recognise the course tutor, the pure translation of the last part of the last sentence, i.e. "the system doesn't know you" this implied that the tutors were not known or they were not part of the University community. Such statements were likely to reinforce the lack of belonginess of the part-time lecturers or the notion of "visitors to the kingdom" (Hopkins, 1989, p.3) at NUL, hence my interpretation of the reply as inappropriate, over and above the lack of access to teaching and learning resources and their limited time and money spent by the tutors to travel to the campus library.

Participant CT02 also expressed some feelings about the library services as follows:

"Ke hore ke sokotse! Ke eona eo ke utloang e ntuba nna. … ke hore … ke hore … nthoeno … ' na ke e utloe e le eona e n-sufferisang haholo".

I mean, I have struggled! This is the most frustrating one ... I mean … I mean … that issue … for me, it is the one that makes me suffer most.

Other than the foregoing identified challenges, the reported enablers by the tutors are discussed in the next section.

Enablers of blended distance learning pedagogy

A deductive theme emerging from the responses of the tutors was that availability of ICT resources which facilitate access to 'Thuto', such as smartphones, as well as prior technology experience were the enablers of blended distance learning in the context of Lesotho. Furthermore, the emerging theme was that blended distance learning was feasible in the context of Lesotho. This perception was based on the evidence of critical blended learning success factors which included the enthusiasm of tutors and the learners, availability and usability of solar energy to charge technology devices, supportive local internet service providers, and existing pedagogy which entailed active engagement of learners and collaborative teaching and learning approaches.

General feelings, suggestions and recommendations of tutors

The general feeling expressed by the tutors was that blended distance learning pedagogy was their felt need. However, it had to be well introduced and mandatory. For instance, Participant CT01 argued

"Hape hore re hle re transformele ho e-learning, kannete university e tla tlameha ho etsa more effort, as for now, ka li attempt tse ntseng li etsuoa, I think re tla lieha ho fihla".

Again, in order for real transformation to e-learning to occur, truly the university has to put in more effort, as for now, with the attempts being made, I think it will take a long time to get there.

Similar to the learners, the tutors emphasised the need for NUL to put more effort towards the adoption and implementation of blended distance learning. The suuggestions for the needed intensification of effort included the development of NUL blended distance learning policy; increased access of tutors and learners to access? technology at NUL, indicated by among others, more investment by NUL on ICT infrastructural updates and resources (e.g. computers and Wi-Fi bandwidth and speed) as well as enhanced digital literacy through training of the tutors and the induction of the learners in their first year of study.

Given that the part-time tutors were not only respondents in the study but also colleagues, their general feelings about this study were sought. The responses of the tutors are discussed under the following sub-sections: the tutors' perceptions on the strenghts of the study;

Tutors' perceptions on the strengths of the study

The tutors felt that this study was generally "very helpful to the institution … especially, IEMS" and "likely to move the institution forward" (Participant CT01). The study was also said to have positively influenced the values, beliefs and perceptions on blended distance learning. For instance, Participant CT02 generally perceived the online instruction pilot as a "very helpful exercise" which, according to Participant CT01 built the tutors' capacity to function more effectively in the digital world of work, not only in NUL programmes but also in their respective full-time jobs.

Participation in this study was also said to have enhanced knowledge and understanding of AR methodology for the tutors and the learners taking Course AED270 (Introduction to research methods in adult education). The study therefore contributed to academic development and employability of the tutors and learners by providing relevant research skills and digital literacy, among others. Notwithstanding the foregoing strengths of this study from the perspective of the tutors, the shortcomings were also identified, as discussed in the next sub-section.

Perceptions of Tutors on the shortcomings of the study

Owing to the scope, nature and relevance of this study to implicit ICT developments at NUL, both Course Tutors maintained that NUL should have increased its adoption and support for the fieldwork activities. For instance, it should have increased prior institutional planning and preparation for the engagement of research assistants, for the provision the resources, for prior communication with the intended sample, and for the adjustment of the Course Tutors' workload to enable more meaningful contribution to the study. In addition, Participant CT01 emphasised that the suggested prior communication should have also explicitly addressed critical aspects such as the expectations of NUL from the part-time tutors, the review of the workload to accommodate research activities and incentives for the tutors participating in the study. In this manner, NUL could have maximised the benefits of this study, perceived as "…very helpful exercise" (Participant CT02), "… very helpful to the institution … and likely to move the institution forward" (Participant CT01). These perceptions reverberated the emotional view that was voluntarily emailed to me by one colleague or participant in my research seminar that

You have successfully given our spade work the academic approach it badly needs… and I have tears in my eyes as I type this email because you are doing so much to enhance the humble attempts we've been making all this time (see Appendix 14).

Amid the suggested shortcomings of this study, mainly the inadequate institutional planning and support likely to have resulted in limited support from the tutors and learners, the responses of the tutors validated the enthusiasm of the learners. Both tutors also observed that the learners were initially reluctant to go to the computer lab for training. The reluctance was associated with the limited digital literacy since, towards the end of fieldwork, the tutors maintained that the learners were quite happy with the activities of this study and eager to participate or go to the computer lab.

Summary of the results from the thematic analysis of the tutors' semi-structured interviews

Informed by both prior technology experience of the tutors in the general context of Lesotho and NUL, as well as the new knowledge and experience acquired from this study, the perceived benefits common to both tutors and learners included enhanced digital literacy and cost-effectiveness. In addition, the tutors maintained that blended distance learning was likely to address the felt need (Elliot, 1991) for the enhancement of existing pedagogy. Examples of how technology could improve the existing pedagogy included increased collaboration in instructional design and consistency in course delivery, the creation and storage of common and contextually relevant teaching and learning resources and records of tutor-learner interaction and discussion for future reference. The tutors also validated the limited national and institutional ICT strategy, structure, support (AR Cycle 1) and low technology experience of the tutors, as suggested in AR Cycle 2 and AR Cycle 3. Nonetheless, the findings validated the learners' perceptions that a blend of face-to-face, print-based and online instruction was feasible in the context of NUL. Additionally, similar to learners who participated in this study through open-ended questionnaires and the focus group, the need for more effort and commitment by NUL was emphasised. The anticipated indicators of the enhanced effort and commitment, according to the tutors would be, among others, development and implementation of an explicit blended distance learning policy, more investment in ICT infrastructure and resources and increased support for the tutors and learners.

Summary of the evaluation

The focus of RQ.4 was on the design of a contextually-relevant blended distance learning pedagogic model for NUL. Informed by the findings of low digital literacy in AR Cycle 1 and SO Cycle 1 of this study, the tutors and learners were inducted on online instruction in AR Cycle 2 and two of its SO Cycles (SO Cycle 2 and SO Cycle 3). Drawing on Salmon's (2002) Five-stage framework, with the evidenced motivation of the tutors and learners and their mastery of the skills to access Thuto, the envisaged online instruction was piloted over a period of four weeks. An evaluation of the pilot study revealed the challenges which included limited ICT resources, skills and institutional support as well as time constraints. Nonetheless, the perceived benefits such as pedagogic flexibility and enhanced communication, interaction, collaboration were also evidenced. The next chapter provides an analysis and discussion of the findings presented in this chapter.

CHAPTER FIVE: AN ANALYSIS AND DISCUSSION OF THE FINDINGS

5.0 Introduction

Influenced by the implicit vision of NUL to adopt and implement technology-enhanced teaching and learning in its existing part-time or ODL programmes, this study set out to determine a contextually-relevant blended distance learning pedagogic model. This chapter demonstrates how the AR cycles of this study impacted on one another in response to the RQs. Guided by theoretical and conceptual frameworks which emphasise the complexity of change (Fullan, 2009; Davis, 2018) and the importance of policy and frameworks, the findings are analysed and discussed under the four research questions of this study.

5.1 The First Research Question

RQ.1 and RQ.2 were addressed in the first Cycle of this AR. Informed by the action research model, adapted from Elliott (1991) (see Figure 17), RQ.1 constituted the Initial Reconnaissance (fact-finding and analysis) stage. The emerging theme was that the national and institutional ICT strategy, structure and support were inadequate (see Table 13). Thus, placing both the country and the institution (NUL) at the first stage (i.e. Awareness and Exploration) of Graham, Woodfield and Harrison's (2013) framework for adoption and implementation of blended learning adapted to this study (see Table 14). These findings are discussed under the national and the institutional levels.

5.1.1 The national level

The findings from the national level are presented under the three markers of transition across the three stages of blended learning (Graham, Woodfield and Harrison, 2013), namely, the ICT strategy, structure and support.

ICT strategy

Different from ICT policies in some African countries which placed “little emphasis on integration and infusion of ICT in the country’s education system” (Yusuf, 2005, p.316), in agreement Isaacs (2007), Isaacs and Hollow (2012) and the Lesotho Communications Authority (2016), there was no explicit national ICT and education policy in Lesotho. In addition, the ICT infrastructure and support by the Government were inadequate (see Table 13). However, the ICT infrastructure was developed sufficiently to facilitate ICT use in education.

These findings evidenced the insufficiency in critical IT policies, inadequate ICT infrastructure and lack of essential ICT services associated with sub-Saharan and other developing countries (Olulobe et al., 2016). The suggested urgency to harmonise the national ICT integration frameworks aligned to the current critical ICT opportunities and limitations (Kihoza et al., 2016) was, therefore, relevant to the case of Lesotho.

As observed in sub-Saharan Africa and other developing countries by Olulobe et al. (2016), the evidenced lack of critical ICT and education policies in Lesotho was likely to thwart enthusiasm, eagerness and passion for IT, thus exposing the country to a further low uptake of technology (Lesotho Council on Higher Education, 2013a) even in the context of higher education. Educational change strategies such as convincing the policy makers of "the value of integrating ICT into the curriculum" (Leask and Younie, 2001b, p.170) were therefore needed in Lesotho to cultivate positive behavioural intention (Lai, 2017) of instructors and learners for successful blended learning uptake, among other values. Central to ICT integration, however, was the requirement for the Government of Lesotho to address the five problematic key areas propounded by Younie (2006, p.385), namely, "management, funding, technology procurement, ICT training and impact on pedagogy".

Closely linked to ICT policies were the factors such as ICT integration frameworks, which were said to be often lacking (Yusuf, 2005) as well as lack of resources, inadequate support for effective integration of technology, inadequate time and lack of rewards for the tutors who were early adopters of digital technology (Merriam, Laura and Bierema, 2013; Graham, Woodfield, and Harrison, 2013; Galanouli et al. 2001). These factors which were evidenced in this study, exposed the national education sector to demoralisation (Kihoza et al, 2016).

Despite the lack of an explicit national ICT and education policy and frameworks, feasibility of blended learning innovation was evidenced in three secondary schools which participated in this study. For instance, influenced by the requirements of O-Level or IGCSE, two of the three secondary schools in Lesotho introduced and sustained computer studies. The third school also initiated computer studies out of the value placed on digital literacy as an employability skill. Notably though, the content of the computer-related subjects was not standardised and at a national level, the subject and its examination were not compulsory, even though it was included in the curriculum. The next section addresses the national ICT structure.

ICT structure

The findings reverberated the ICT infrastructural challenges mostly related to the rural-urban digital divide (LCA, 2017a; Yates, 2008; Molony, 2006) reported not only in developing and in developed countries such as USA (Perrin, 2018), Canada (Hargittai and Hinnant, 2008) and UK (Jackson, 2017). As evidenced in three secondary schools that participated in this study, the existing national ICT infrastructure could facilitate the use of ICT in schools (see Table 11). For instance, in one school where computers were introduced as an internal initiative, the existing infrastructure comprised a total of 95 computers, with the Internet in two laboratories, networked computers in common staff rooms, offices of the heads of departments and the school principal as well as the phone shop (Internet café) serving the students and the local community (NLP1-07). However, the school was located in a less serviced area in terms of Internet coverage. The unequal distribution of 2G, 3G and 4G across Lesotho (LCA, 2017a) was therefore a potential barrier to successful and sustainable blended distance learning initiatives.

The evidenced unequal distribution of the ICT infrastructure which include the lack of electricity in some areas of Lesotho (LCA, 2017b; LCA, 2016b), signified the unequal access to educational opportunities and resources (Chiome, Mupa and Chabaya, 2012; Makoe, 2010) and the risk of exclusion (Boulton, 2017) to which potential learners in rural and remote areas of Lesotho could be exposed, if the envisaged blended distance learning at NUL was not contextualised, hence, the need for a clear and strong institutional leadership or ICT management structure (Gachago et al., 2017).

ICT Support

In consensus with the lack of political will or poor leadership identified as one of the common challenges towards sustainable ICT innovation in African countries (Isaacs and Hollow, 2012), it emerged in this study that support to educational institutions by the Government of Lesotho was inadequate. Although the educational institutions benefitted from tax exemption on ICT products and resources as well as the facilitation of support from external or international partners, the support was inadequate.

Possible forms of governmental support towards ICT use in education were suggested by participants in this study and included the ICT infrastructural developments (including power supply/electricity) in secondary schools, the maintenance and security of the infrastructure as well as the training of teachers (see Table 18). However, the participants maintained that such support was either limited or non-existent, thus echoing the lack of political will reported in the African context (Isaacs and Hollow, 2012).

Lesotho educational institutions, as evidenced in three secondary schools that participated in this study (see Table 18), had to generate some funds to innovate or sustain existing ICT initiatives. For example, schools which benefitted from projects such as the New Partnership for Africa's Development e-Schools Demonstration Project (NEPAD) aimed to develop the ICT infrastructure (Farrell, Isaacs and Trucano, 2007) and had to self-sustain the initiatives beyond the project life.

Limited support towards professional development to teachers which entailed pedagogical and technological skills (Graham, Woodfield and Harrison, 2013) was also evidenced in this study. Such findings indicated a threat to the use of technology in Lesotho education, given the suggested lower digital literacy of teachers than the learners' (Galanouli et al., 2001; Prensky, 2001) or potential preference for traditional teaching methods (Roblyer et al. 2010). More importantly, inadequate ICT skills of teachers have been associated with their attitudes towards the use of technology (Gyamfi-Gyaase, 2015; Westerman, Daniel, and Bowman, 2015; Nihuka and Ngimi, 2013; Lopez-Perez, 2011; Galanouli et al., 2001; Younie, 2001).

The ICT support for the teachers and the learners is critical. Different from the perceptions that the learners were more likely to be digitally literate than their teachers (Galanouli et al., 2001; Prensky, 2001), the findings of this study are that the digital literacy of the learners in their first year of university is low, as is the case in Australia (Kennedy, 2007) and the Republic of South Africa (Thinyane, 2010), thus underscoring the need for induction (Salmon, 2002) of the learners in the Lesotho educational institutions to online instruction.

5.1.2 The institutional level

As with the national level, the findings from the institutional level are presented under the three markers of transition across the three stages of blended learning (Graham, Woodfield and Harrison, 2013), namely, the ICT strategy, structure, and support.

ICT strategy

The findings on the applied ICT strategy by all the participants (the NUL Management Team, senior administrators, IT specialists, tutors and learners) evidenced the lack of ICT policies at NUL (see Table 13). For instance, in line with the Awareness and Exploration Stage of the adapted BL framework (Graham, Woodfield and Harrison, 2013) in this study, individual participants informally identified different BL benefits, different institutional advocates or blended learning drivers and that there was no uniform BL definition or policy in place. NUL was, therefore, at the first stage of blended learning adoption (i.e. Awareness and Exploration).

Informed by the communal constructivist approach adopted in this study, therefore, NUL required a CoP (Preston, 2007) consisting of the educators, learners, researchers, IT specialists and policy makers to formulate a contextually sensitive ICT integration strategy. Such strategies, according to Mutanga (2010), should entail policy and planning, financial support for ICT use, improved ICT infrastructure, training in ICT skills and competencies (for teachers and learners) as well as identification and use of appropriate technology and media. In addition, the much-needed NUL ICT policy should align the course level to institutional goals and objectives (Graham, Woodfield and Harrison, 2013), taking into considerations the needs and goals of both the administrators and faculty (Moskal, Dziuban, and Hartman, 2013, p.16). As propounded by Mushi (2009), such strategies should be characterised by effective planning, coordination and communication of beneficial academic and technical and administrative functions across all the sub-systems.

ICT structure

The existing infrastructure had not been expanded sufficiently to accommodate the blended learning across NUL programmes. Specific to IEMS, earmarked as the NUL ODL hub, there was only one computer lab described as dysfunctional and not adequate for pedagogic needs of the entire institute (see Table 13). Consequently, the risk of ODL learners and tutors being accorded a lower status and unequal treatment in terms of resource allocation (Lephoto, no date) was evidenced in this study. For instance, the learners and tutors on the IEMS campus, especially the part-time tutors, had not benefitted from the training on the use of 'Thuto' offered to their counterparts on the main NUL campus.

ICT support

At an institutional level, ICT support to NUL faculty and learners was also reported as informal, unstructured and inadequate. For instance, there was no technical and pedagogical support for the tutors, especially on the IEMS campus. Support to the learners in courses or programmes that may adopt blended learning was also lacking (see Table 13).

As with similar contexts, therefore, the national ICT support in Lesotho was lacking. However, there was also evidence of successful ICT innovations by the participating secondary schools in this study without support by the Government.

Summary of findings from Research Question One

In response to RQ.1, it emerged that the ICT strategy, structure and support in Lesotho and, in particular, at NUL were lacking. Thus, the institution was at the first stage of the blended learning framework adapted from Graham, Woodfield and Harrison (2013). In addition, it emerged that IEMS was even more inadequately resourced to anchor the envisaged ODL programmes delivered through blended learning. Nevertheless, the usability of technology in three secondary schools that participated in this study evidenced the feasibility of blended learning, despite the ICT infrastructural limitations. A discussion of the findings on RQ.2 follows.

5.2 The Second Research Question

RQ.2 addressed the two markers of transition across the three stages of blended learning which, in this study, were added to Graham, Woodfield and Harrison's (2013) original blended learning adoption framework. The two additional markers were prior technology experiences of the tutors and the learners. The emerging theme was that the digital literacy of the tutors and learners in NUL part-time or ODL programmes was limited. The findings are discussed under these two markers.

5.2.1 The tutors

Limited technology experience of the tutors was evidenced in this study, thus, rendering them "digital immigrants" (Prensky, 2001, p.1). However, it also emerged that the adult learners in this study were also more of digital migrants than natives. For instance, only 46% (14 out of 30) of the tutors had access to a laptop while 27% (8 out of 30) could access desktop computers (see Figure 24). These findings signified a low usage of technology in an educational context.

While 40% of the tutors clearly stated that they did not use any form of technology in teaching and learning, the use of technology was limited to email (43%) and social networks and specifically the WhatsApp. The limited or no use of technology was attributed to lack of support by NUL.

Notwithstanding the limited access and therefore use of desktop and laptop computers by the tutors, a mobile phone was accessible to the majority of the tutors (93%). This evidence supported the report that mobile phones were the mostly owned device by the Lesotho residents across the urban, peri-urban and rural settlements (LCA, 2016b). Although the challenges of limited ICT infrastructure and support by NUL emerged, this evidence reverberated accessibility, affordability and usability of a smartphone in the African educational context phones (Ng'umbi, 2013; Saidu et al 2012; Makoe, 2010; Mahenge and Nihuka, 2009; Furuholt and Kristiansen, 2007). NUL should therefore explore ways to exploit the use of smartphones for instructional purposes.

Available mobile phones to the tutors were mostly used for purposes of making phone calls and texts rather than for instructional purposes. For instance, 67% of the tutors had neither used nor rated their skills on using the LMS (Thuto) (see Table 15). Consequently, the necessary technological knowledge (TK) of the tutors to complement their TPACK was lacking.

Other than smartphones, desktop and laptop computers and tablets, Perrin (2018) asserted that the determinants of digital technology adoption include home broadband connection. In this study where the majority of the tutors (90%) were engaged on a part-time basis, their access to the Internet was critical. The findings, however, showed that 4 out of 30 tutors had access to a dial-up Internet. Seven of them had access to the broadband, while 12 could access the WiFi. Furthermore, Internet access on the IEMS campus was limited. These findings indicated that NUL would have to facilitate access to the Internet by the tutors, both on campus and off-campus if the envisaged blended distance learning pedagogy were to be adopted and implemented. The next section discusses the technology experience of the learners.

5.2.2 The learners

Similar to the tutors, digital literacy of the adult learners in this study was limited. Access to ICT on the IEMS campus (i.e. hardware, software, and the Internet) was limited. For instance, the 48% of the learners who indicated that they had ICT access on campus mostly referred to the three desktop computers in the library or the limited Internet access through their personal devices (i.e. mobile phones, tablets, laptops, and desktop computers). Notably, as indicated by 93% of the students (156 with exclusive access, 19 with shared access, and one with limited access), the mobile phone was the most accessible and the most used technology (see Table 18). Access to the tablets (8%), laptops (52%), and desktop computers (48%) was in the minority. This evidence was validated by the findings that 100% of the learners who participated in a focus group had access to mobile phones; 21% could access laptops; while none of the participants had access to a tablet (see Table 19).

From the learners' focus group, it emerged that the Internet was accessible even in the rural and remote areas of Lesotho mostly through mobile data on smartphones (i.e.

tethering and portable hotspots) and Internet cafes, rather than the dial-up Internet, fixed broadband or WiFi. Nonetheless, as with their tutors, the participating learners' use of the smartphones was limited to phone calls, texts, and search for information on the Web (see Table 20 and Table 21). Furthermore, there was no marked difference between the use of technologies by the learners at Diploma and Degree levels. These findings therefore implied that the level of study did not impact the digital literacy of the learners at NUL.

From the sample of the learners who completed closed-ended questionnaires, 49% had used mobile phones for learning purposes (see Figure 25). The specific use of mobile phones by the learners was mostly to communicate with peers on social networks (particularly, WhatsApp); phone calls, email and to search for study-related material mainly on Google. These findings on prior technology experience confirmed the potential of mobile phones to address the demands of the 21st century problems in Africa due to its accessibility to the learners (Ng'umbi, 2013; Thinyane, 2010; Makoe, 2009; Furuholt and Kristiansen, 2007), including those in Lesotho (Sekese, 2010).

Following the identified limited digital literacy of the tutors and learners, the online instruction pilot conducted in this study evidenced the required motivation and access (Salmon, 2002) to the NUL LMS (Thuto). However, owing to the differences in the ability of the learners to use technology, the existing NUL training module (see Appendix 10) had to be contextualised. For instance, while the module was designed to train the NUL tutors and learners on how to access and use 'Thuto', some of the learners lacked the basic skills such as switching a desktop computer on. Figure 30 illustrates the gap between the evidenced training needs of the learners and those addressed by the then existing NUL training manual.

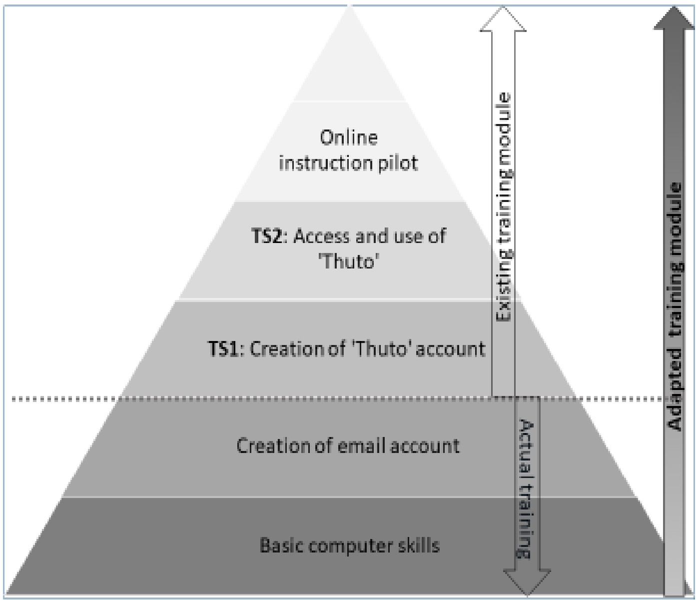

Figure 30: The difference between the existing NUL training module and the adapted evidence-based module proposed in this study.

The limited or lack of basic computer skills evidenced in this study resonated with the findings of a study of learners in a South African university, attributed to the diversity of social and economic backgrounds and subsequently, varying levels of access to and use of technology (Thinyane, 2010). Furthermore, the differences in the pace or levels of mastering the required skills (Salmon, 2002) were also evidenced. For instance, some of the learners needed help with how to use a computer mouse, while others were concerned with the creation of a personal email or 'Thuto' account.

Informed by the foregoing evidence which matched the internal (i.e. resources and skills) and external factors (i.e. opportunities and risks) (Salmon, 2005) rather than adopting 'off-the-shelf' strategies or 'traditional market-led' eLearning approaches

(Merriam and Bierma, 2013; Hamel and Valikangas, 2003), the envisaged adoption and implementation of blended learning at NUL should entail an introduction to basic computer skills prior to the introduction to the use of 'Thuto'. This section is followed by a summary of the technology experience of the tutors and learners which informed the blended learning adoption framework adapted from Graham, Woodfield and Harrison (2013) (see Figure 11) in response to RQ.1 and RQ.2 of this action research.

5.2.3 Summary of the findings from RQ.1 and RQ.2

In consensus with the reports from sub-Saharan Africa and other developing countries (Olulobe et al. , 2016; Raphael and Mbete, 2016; Renau and Pesudo, 2016; Kisanga and Ireson, 2015; Yates, 2008; Molony, 2006), the findings from RQ.1 and RQ.2 (see Table 14) evidenced lack or inadequacy of ICT and education policies, ICT infrastructure and resources, technical and pedagogical support for the tutors and learners and the general low digital literacy of the tutors and learners. Nonetheless, even though institutional ICT infrastructure and resources were inadequate, the national ICT infrastructure was developed to a level where it could anchor educational innovations as evidenced by successful delivery of different computer-related subjects in Lesotho secondary schools. In addition, the needed motivation and enthusiasm of the tutors and learners on technology integration were evidenced. The next section addresses RQ.3 which focused on pedagogic aspects of the envisaged adoption and implementation of blended distance learning.

5.3 The Third Research Question

Following the findings of limited technology experience and support for the tutors and learners which were evidenced in AR Cycle 1 and confirmed, SO Cycle 1, RQ.3 which, in turn, aimed to determine how NUL could adopt and implement the blended distance learning pedagogy, was addressed in AR Cycle 2 of this AR. The cycle was guided by the notion of exploring an existing pedagogy to inform a new one (Beetham and Sharpe, 2007) and the TPACK framework.

Influenced by the reviewed literature which suggested that the existing pedagogy must inform a new one (Moskal, Dziuban and Hartman, 2013; Beetham and Sharpe, 2005), a SWOT analysis of the andragogy was conducted. Andragogy was one of the identified strengths of the existing pedagogy which tutors preferred to retain and enhance through use of technology. For instance, key to the teaching and learning methods in this adult learning setting was the active engagement of the learners achieved through communication, interaction and collaboration (see Table 22).

Specific pedagogic areas identified for improvement through the use of technology in Course AED270: Introduction to research methods in adult education were mostly related to improved communication between and among the tutors and learners learner-teacher, learner-learner, learner-content, teacher-teacher, teacher-content interaction (Trinidade, Carmo and Bidarra, 2000; Anderson, 2003; Saudi et al., 2010); and collaboration (tutor-tutor, learner-learner). These areas were perceived by the course tutors as critical to enhance existing participatory methods which entailed active involvement and engagement of the learners individually and in study groups.

Similar to the findings of low digital literacy of NUL tutors in part-time or ODL programmes, the findings from the SWOT analysis evidenced the PK and CK of the tutors and the lack of TK. Thus, validating not only the need but also the urgency of professional development of NUL tutors with a view to constructing the technological, pedagogical and content knowledge for a "technology-rich" teaching and learning environment (Olofson, Swallow, and Neumann, 2016, p.198). In view of the limitations of TPACK which include its lack of comprehensive description and evaluation of teachers' development (Koh and Chai, 2014; Yeh et al., 2016), it can be argued the training of Course AED270 tutors and the subsequent voluntary participation by two of the three tutors in the pilot study of online instruction to some extent addressed their TK.

5.4 The Fourth Research Question

The focus of RQ.4 was on determining a contextually relevant blended distance learning pedagogic model for NUL. Informed by the findings from the first three research questions of this study, the focus of RQ.4 was on determining a contextually relevant blended distance learning pedagogic model for NUL. The first Research Question (RQ.1) explored the national and institutional ICT strategy, structure and support; RQ.2 focused on the technology experience of the tutors and learners in NUL part-time or ODL programmes while RQ.3 addressed the existing pedagogy and how it can be enhanced through the use of technology. Figure 31 provides a summary of the existing situation at NUL and the proposed improvements across the course and institutional levels.

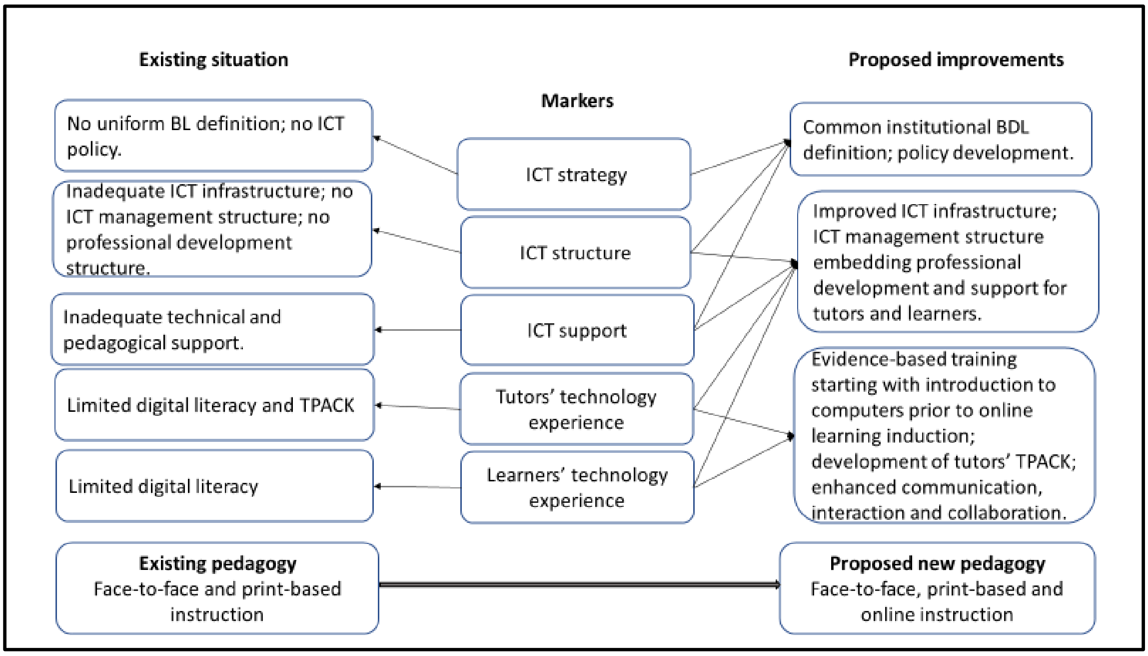

Figure 31: A summary of the findings and the proposed ICT improvements at NUL.

Contrary to the 'classical' or contemporary definition of blended learning (Sharma, 2010) which entails face-to-face and online instruction (Blissit, 2016; Brown, 2016; Garrison and Vaughan, 2011), the emerging theme was that the contextually-sensitive blended distance learning pedagogic model for NUL should combine face-to-face, print-based and online instruction, using asynchronous media. This proposed model was informed by the evidenced challenges and critical success factors which were not unique to the context of Lesotho but also identified in the context of sub-Saharan Africa and other developing countries. For example, the use of print-based media would minimise the disruption of the learning process in cases where the challenges associated with the unreliable Internet connectivity (Isaac and Hollow, 2012) were experienced.

It also emerged that the most accessible technology to the tutors and learners at NUL was a mobile phone. In addition, the compatibility of smartphones to the existing NUL

LMS (i.e. Thuto) was evidenced during the online instruction pilot test conducted in this study. As a result, Course AED270 was redesigned to blend face-to-face, print-media and online instruction with emphasis on smartphones. The instructional redesign built onto the following existing pedagogic tools:

1) An existing Course AED270 module (Ralise, 1996).
2) AED270 course outline – 2014/15.
3) Course AED270 face-to-face weekend schedule, and class timetable.
4) COL ODL Template (Commonwealth of Learning, 2007).
5) Other cited texts and resources listed under bibliography.

A course map which guided the instructional redesign process is attached as Appendix 15. An evidence-based blended distance learning module for Course AED270 was co-authored by the researcher and one of the part-time colleagues was completed, peer-reviewed, edited and submitted to NUL for implementation in the Diploma in Adult Education programme. The design and development of this module signified the end of AR Cycle 3 and the PhD end point. A discussion of the evidenced challenges, critical success factors and pedagogic factors follows.

5.4.1 Challenges

The findings of this study validated the reported major challenges to ICT adoption and implementation in Lesotho. They include limited digital literacy among teachers (LCA, 2017a), lack of IT or ICT policies, unreliable networks, high Internet costs, and lack of electricity in some areas (LCA, 2016b). In addition, despite its implicit vision to integrate technology into teaching and learning, specifically to its ODL programmes based on the IEMS campus, NUL lacked the required institutional leadership to facilitate the alignment of educational goals across the course, institutional and national levels or ecosystems of the Arena Framework (Davis, 2018). In agreement with Moskal, Dziuban, and Hartman (2013, p.16), NUL needs to align “the goals of both the administrators and faculty” if the envisaged new pedagogy by NUL is to succeed.

Furthermore, in consensus with Mushi (2009), central to this leadership role towards the proposed blended distance learning innovation at NUL should be effective planning, coordination and communication of beneficial academic, technical and administrative functions across all the sub-systems. This implies the development of a clear institutional ICT policy with an explicit management structure, taking into consideration the roles of all critical stakeholders such as the learners, tutors, key administrators, IT specialists and the NUL Management Team.

At the national level, the reported unreliable Internet by some of the participants in this study could be attributed to the lack of or limited high-speed Wifi such as LTE (4G) and 21Mbps UMTS/HSPA in rural and remote areas of Lesotho (LCA, 2017a). In addition, the “astronomical cost of high-speed Internet connectivity” in Lesotho could be another barrier to the Internet access, particularly to the rural populace associated with poverty (the International Fund for Agricultural Development, n.d.). This situation highlighted the urgency of explicit collaboration mechanisms between the relevant Government ministries of Lesotho, the private sector, the civil society institutions (Isaacs, 2007) and the higher learning institutions such as NUL.

Amid the identified challenges at the national and institutional level, behavioural engagement and emotional engagement of the learners was evidenced (Turner et al, 2014). Contrary to the assumption that the ICT challenges in developing countries could thwart the enthusiasm of the learners (Olulobe et al., 2016), therefore, the adult learners continue to engage online. A discussion of the evidenced critical success factors follows.

5.4.2 Critical success factors to technology integration

In a study of technology integration which involved ten institutions higher learning institutions in Africa, Isaacs and Hollow (2012) concluded that the second most influential factor was the infrastructure for ICT-enhanced learning and training (i.e. electricity, buildings, broadband). This factor, which was likely to influence other success factors, was evidenced in this study. For instance, with the existence of electricity, buildings and Wifi at NUL, although limited, this institution could facilitate access to appropriate content for ICT-enhanced learning and training, professional development and training for ICT-enhanced learning and training as well as access to affordable and reliable computers (Isaacs and Hollow, 2012, p.22).

Other factors evidenced in this study include the informal use of mobile and social devices and social for communication, interaction and collaboration between and among the learners and tutors, mostly through WhatsApp. This was a positive development and an indicator of the enthusiasm to adopt the use of Web 2.0 and similar technologies, including Social Networking Sites (Raspopovic et al., 2017; Olulobe et al. 2016) for “more flexible and creative learning” (Boulton, 2017, p.80). The next section discusses other pedagogic factors which informed the proposed blended learning pedagogic model for NUL.

5.4.3 Pedagogic factors

Pedagogic factors which were evidenced in this study included the low utilisation of existing ICT infrastructure and resources, the adoption of the systems not suited to the educational contexts, motivation, access, enthusiasm and supportive attitudes.

Low utilisation of existing ICT infrastructure and resources

In line with the reported lack of innovation by universities in sub-Saharan Africa and similar contexts (Ssekakubo, Suleman and Marsden, 2012), the low utilisation of existing ICT infrastructure and resources and the lack of evidence-based system implementations were evidenced at NUL. Although the institution had invested in an ICT infrastructure which included an LMS and computers, the infrastructure had not been evaluated for usability (Mbete, 2015) and compatibility with available personal devices for the tutors and learners. In addition, usability in terms of the intended users' skills (i.e. tutors and learners) to access and use the LMS had not be assessed.

Bhalalusesa, Lukwaro and Clemence (2013) and Mayoka and Kyeyune (2012) have argued that the adoption and implementation of the systems which were neither user-friendly nor contextually-relevant were likely to yield unsupportive attitudes towards technology integration. For instance, prior to the pilot study of online instruction conducted in this study, the tutors and learners perceived computers as complex or difficult to use. However, by the end of the pilot study, the participants expressed the preference for interactive and meaningful learning which incorporates the use of multimedia including Web 2.0 technologies, associated with adult learners (Merriam and Bierma, 2013; Boling et al., 2012).

Other than the usability of the existing ICT infrastructure and resources at NUL, the enablers of pedagogic innovation such as smartphones and tablets (Freedman, 2017), were also available to the learners and tutors in higher education. Arguments that these personal mobile devices provided the much-needed spontaneity and personal access to a variety of educational resources at a relatively low cost in comparison to desktop computers (Kukulska-Hulme, 2005) were evidenced in this study. NUL could therefore further invest in aspects such as technological and pedagogical development of tutors to upscale the design of quality learning material, improved support services and increased awareness of LMS to the potential users, recommended by Mbete (2015).

From the foregoing discussion of the evidenced challenges, critical success factors and pedagogic factors, a blend of face-to-face, print-based and online instruction was most suited to the context of NUL. However, as professed by Bullen (2014), an evidenced-based implementation of the proposed model should have a minimal impact on the existing pedagogy and be gradually intensified and aligned to the ICT context.

5.5 Summary of the chapter

Influenced by the implicit vision of NUL to adopt and implement technology-enhanced teaching and learning in its existing part-time or ODL programmes, this chapter provides an analysis of the findings in response to the four research questions of this study. The analysis and discussion of the findings was guided by the three AR Cycles and SO Cycles leading to the theme that a contextually-relevant blended distance pedagogic model for NUL should combine face-to-face, print-based and online instruction (see Tabe 33). However, the adoption and implementation of the proposed model should be gradual and aligned to ICT developments at NUL, taking into consideration the factors such as the policy development, infrastructure, mastery of online learning skills of the tutors and learners, accessibility and affordability of online learning resources. Following this chapter is the concluding chapter.

AR Cycle	RQ	Findings	RQ	Findings	RQ	Findings
One	1	Inadequate national and institutional ICT strategy, structure and support; feasibility of blended learning using smartphones.				
	2	Limited digital literacy of tutors and learners; enthusiasm on use of technology.				
Two			2	Motivation and mastery of skills to access and use 'Thuto' by tutors and learners.		
			3	Tutors' lack of TK to complement their PK and CK; technology integration needed to enhance communication, interaction and collaboration.		
Three					4	Usability of 'Thuto'; mastery of online learning skills; learners' behavioural engagement; learners' emotional engagement; a blend of face-to-face, print-based and online instruction was the contextually-relevant pedagogic model for NUL.

Table 33: A summary of the findings of this study guided by the Action Research (AR) cycles and the Research Questions (RQs).

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.0 Introduction

This chapter demonstrates how the aim and objectives of this research were met and explains the limitations of this study. An explanation of the original contribution of the study is then presented, followed by the recommendations for policy implications at micro, meso and macro scales. Next, a reflective account of my personal knowledge, gained from/living educational theory emanating from this study is presented, and I conclude the chapter with some suggestions for future research.

6.1 How this study has met the research aim and objectives

The research presented in this thesis was motivated by the implicit vision of NUL to integrate technology into teaching and learning. In view of the reported unsuccessful and unsustainable ICT innovations in sub-Saharan Africa and other developing countries, the aim of this study was to design an evidence-based blended learning pedagogic model for NUL. The specific objectives of the study were to:

Identify the existing national and institutional ICT strategies, structures, and support for the envisioned blended distance learning pedagogy by NUL;

Explore prior technology experiences of adult learners and tutors in existing NUL part-time/ODL programmes;

Determine how blended distance learning pedagogy could be adopted and implemented in the context of NUL;

Design a contextually-relevant blended distance learning pedagogic model for NUL.

As an academic aiming to improve the teaching-learning practice within my institution, I decided to use an action research methodology to address these research objectives. This methodology, recognised for its ability to facilitate a better understanding of the nature of educational problems and more insight into teaching and learning (Anderson, 2010), entailed three AR Cycles of planning, action, evaluation and reflection as well as three SO cycles, described as quick, shorter, and/or less intensive cycles.

To meet the first two objectives of this study, in the first AR cycle, I adapted Graham, Woodfield and Harrison's (2013) blended learning adoption framework to explore the national and institutional ICT strategies, structures, support in Lesotho and the technology experiences of the tutors and learners in the NUL part-time or ODL programmes. In their original framework, Graham, Woodfield and Harrison (2013) focused only on the institutional level, using three markers (ICT strategy, structure and support) to measure or monitor the transition of universities from the traditional pedagogy to blended learning and suggested the inclusion of the tutors and learners as makers. In consensus with the educational change theories which emphasise complexity (Fullan, 2007; Davis, 2018) and the importance of policy development and review (Preston, 2007), I adapted the framework to include the course level (i.e. technology experience of the tutors and learners) and applied the model to the national level, with focus on ICT strategy, structure and support.

The participants in this first cycle of this action research (AR Cycle 1) were selected from the national, institutional, and course level. They included ICT and education national authorities, the secondary school representatives, the Internet service providers, the NUL Management Team, the relevant senior administrators, the IT specialists, tutors and learners. Central to the selection of these participants was the argument that tutors and learners are the key stakeholders in educational contexts; they cannot be excluded from constructing knowledge on blended learning adoption and implementation. Hence, their inclusion in the adapted framework.

From the evidence of the existing national and institutional ICT strategy, structure, support and technology experience of NUL tutors and learners, I concluded that NUL was at the exploration and awareness stage (i.e. the first stage) of the blended learning adoption framework adapted from Graham, Woodfield and Harrison (2013). This was evidenced in the AR Cycle 1 by lack of explicit ICT strategy, structure, support and the low digital literacy of the tutors and learners on the IEMS campus. Informed by the findings of the low technology experience of the tutors and learners, a deeper exploration of technology experience with a smaller sample selected from a single course in the first spin-off cycle (SO Cycle 1) confirmed the low digital literacy.

To meet the third objective of this study (i.e. to determine how blended distance learning pedagogy could be adopted and implemented in the context of NUL), in the second AR Cycle, I conducted a SWOT analysis of the existing pedagogy to inform the new one. The emerging theme was that technology integration was needed to enhance communication, interaction and collaboration in teaching and learning. In agreement with the literature that teachers in developing countries often lacked the required technology integration knowledge (Ifinedo, Saarela and Hamalanen, 2019; Kihoza et al., 2016). It also emerged that the tutors lacked technological knowledge (TK) to complement their pedagogical knowledge (PK) and content knowledge (CK).

From this evidence which was validated throughout the training of the tutors and learners in AR Cycle 2, I would argue that an induction of the NUL online learners is best preceded by an introduction to the basic use of computers or a computer awareness course. This implies a stage before the first stage of the Salmon's (2002) Five-stage Framework (i.e. motivation and access). Figure 32 illustrates the proposed model for induction of online learners in NUL and similar contexts.

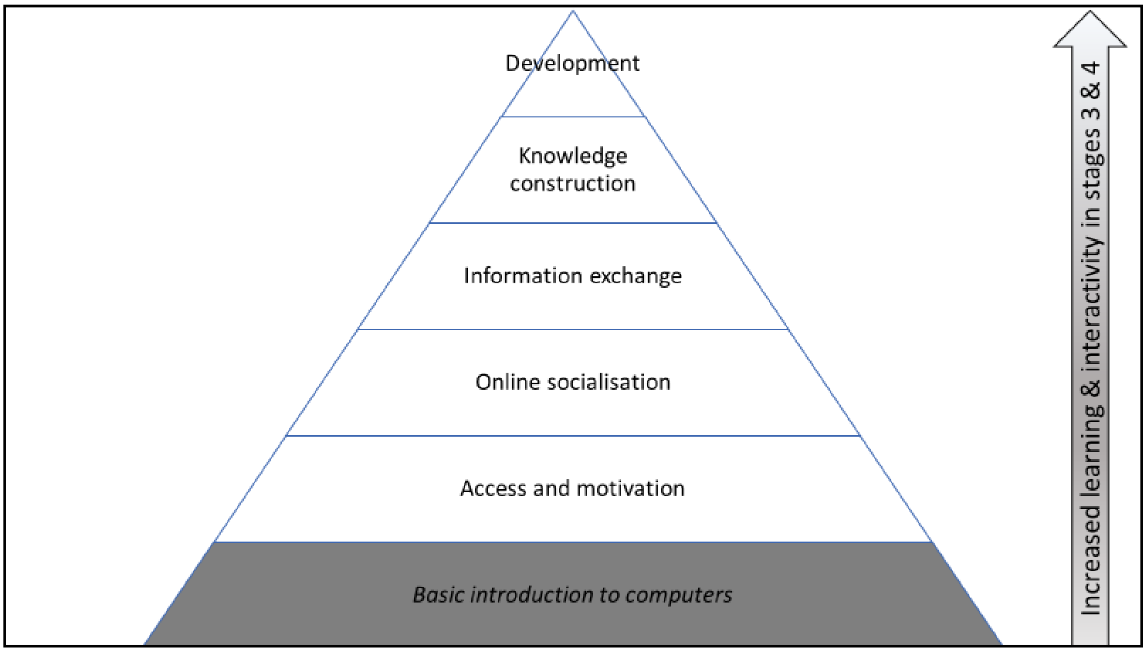

Figure 32: A proposed stage before Salmon's (2002) five-stage framework for NUL online learners.

Notwithstanding the evidenced challenges which included the low digital literacy, lack of explicit ICT and education policies and the poor or unreliable Internet connection, critical success factors for adoption and implementation of blended learning were also evidenced. These included the motivation and mastery of the skills by the tutors and learners to access ‘Thuto’ and engage online. In this regard, I have argued that a blend of face-to-face, print-based and online instruction, rather than the ‘classic’ combination of face-to-face and online instruction (Sharma, 2010), was the most suited pedagogic model to the context of NUL. The appropriateness of this proposed model was also informed by the evidenced availability of smartphones usability of the existing LMS at NUL.

The evidence gathered in response to the research objectives questions One, Two and Three of this study which were addressed in AR Cycle 1 AR Cycle 2 enabled me to meet the fourth objective (i.e. to design a contextually-relevant blended distance learning pedagogic model for NUL). This was achieved through a pilot study of an online instruction and a collaborative instructional design of a contextually-relevant blended distance learning pedagogic model for NUL, in AR Cycle 3. Key to the pedagogic change was a reduction of seat time (i.e. face-to-face instruction) and replacement with online instruction. Hence, the review of the existing self-instructional print-based module to include asynchronous online activities and minimal online instruction. The implementation of this new evidence-based pedagogic module at NUL in 2018/2019 academic year (i.e. post-PhD) and its subsequent review constitutes the fourth action research cycle (AR Cycle 4) of this longitudinal research.

6.2 Contribution to knowledge

There are five key findings and contributions to new knowledge derived from this research:

Development and application of a framework for adoption and implementation of blended in higher learning adapted from Graham, Woodfield and Harrison (2013) to include the tutors and learners as markers of transition from the traditional face-to-face and print-based instruction to a combination of face-to-face, print-based and online instruction. In recognition of the complexity of the educational change (Fullan 2009 and Davis 2018), different from the original framework which was applied only to the institutional level, I have demonstrated that the framework was applicable to the three educational system levels or ecosystems, namely, the course, the institution, and the national level.

The originality of this study included a methodological review of Elliott's (1991) action research model to include spin-off cycles (Piggot-Irvine, 2002). It seems clear from this research that the effects of implementation of general or amended plans within an action research may generate outcomes that necessitate quick, shorter or less intensive cycles of planning, action, evaluation, and reflection (Piggot-Irvine, 2002) to inform revision of the general plan for the next AR cycle.

I have demonstrated in this research that educational contexts characterised by the low or non-existent digital literacy could benefit from a merger of Salmon's (2002) five-stage framework and Preston's (2007) braided learning theory to include policy development as the sixth stage. Thus, collaboratively creating the online learning knowledge collaboratively not only for the 'self' and the community of learning (Holmes, 2001; Leask and Younie 2001; and Meehan, Holmes and Tangney, 2001) but also to inform policy development by the anticipated CoP (Preston, 2007).

From the evidence presented throughout the thesis I have shown that in developing countries that lack explicit national and institutional ICT and education policies, such as Lesotho, an introduction of the learners and tutors to the basic use of computers or a computer awareness course should precede an induction to online learning. For instance, the learners and tutors at NUL lacked the needed basic digital literacy to facilitate online motivation and access (i.e. the first stage of Salmon's (2002) five-stage framework).

Owing to the evidenced limited knowledge on the use of technology for educational purposes in this study, I have argued that TAM (1989) seemed not to be applicable to the first three action research cycles conducted in this study. For instance, the participants lacked the knowledge to accurately determine their Perceived Use (PU) and Perceived Ease of Use (PEU) of technology.

The new knowledge generated in this study will be disseminated at different levels of Davis' (2018) ecosphere. For instance, at the course level, during the recruitment of participants for the next AR cycles, the findings were shared with the previous participants (tutors and learners) in earlier stages of the action research and potential participants in the next stage. The findings were also disseminated through a research seminar, an implementation workshop, a series of instructional design workshops at

IEMS funded by the Commonwealth of Learning (COL), and a conference organized by NUL. The participants in these workshops included part-time tutors who were also full-time academics at NUL and other higher learning institutions in Lesotho, thus, representing both the institutional and the national level. The findings will continue to be disseminated in such forums, including other institutional and national workshops and conferences.

Although the scope of this study did not extend to the global ecosphere, I disseminated the findings through the platforms such as the NTU School of Education and School of Social Sciences conferences, The International Council of Distance Education Doctoral Students Consortium and a peer-reviewed journal article (being reviewed for re-submission). The findings will also be disseminated through the local, regional and international conferences and associations such as the Distance Education Association of Southern Africa, the relevant regional and international journals, MESHGuides, and blogs.

6.3 Limitations

The following limitations are acknowledged in this study:

The generalisability of the findings of this predominantly qualitative mixed methods research study is limited. For instance, although the findings are analytically (Kumar, 1999; Yin, 2012) and internally generalisable (Maxwell, 2002) to NUL adult and distance learning programmes and similar contexts which have not been investigated, they may not be statistically generalisable (Kumar, 1999; Yin, 2012) to external contexts.

Some of the important aspects of this study were compromised by the broad scope which covered the three levels of the educational system concurrently within a limited timeframe. For instance, owing to the time constraints, participation of the part-time or adult distance learners and tutors in this study was limited in some instances.

In my participant-as-observer (Saunders, Lewis and Thornhill, 2012) role, learner, and an assistant facilitator, in some of the tutors' training sessions I was not able to collect data as effectively as I did in the learners' training sessions. For instance, I assumed a double-role of a trainee and a researcher during the tutors' training. Consequently, the focus of the study shifted more towards the learners than the tutors.

The inadequacy of the institutional ICT infrastructure and accessible personal resources both to the tutors and learners in this study were also a limitation to this study. For instance, not all the participants were exposed to the intended hands-on experience of the use of computers due to the limited number of computers available for their training.

The dearth of the literature on ICT and education in Lesotho was also a limitation to this study. However, the unstructured and open-ended interviews of critical informants at all three levels of the educational system and the grey literature provided useful data to inform the study.

6.4 Recommendations

In consensus with the educational change theories that emphasise the complexity, the interrelatedness and the interdependence of the different levels of the educational system (Fullan, 2007; Davis, 2018), the recommendations for policy implications at micro, meso and macro scales are presented under the national, institutional and course levels. Although both theories were relevant to this study, Davis' (2018) Arena Framework was more applicable to this study of educational change in higher education than Fullan's (2007) model. This is mainly due to the focus of Davis (2018) on teachers and students; as well as digital tools, curriculum and resources in this digital era. While the latter emphasises the roles of actors, such as the teacher, the principal, the students, the parents and the community at the school and the community level. Specific study recommendations to Lesotho follow.

6.4.1 The national level

The following recommendations for policy implications are made to the Government of Lesotho, in particular, the Ministry of Education and Training and the Ministry of Communications, Science and Technology, the Lesotho Communications Authority and the local Internet Service Providers:

i. An explicit ICT and education policy which addresses the five problematic key areas propounded by Younie (2006, p.385), namely, "management, funding, technology procurement, ICT training and impact on pedagogy".

ii. Increased support towards ICT innovation across the education landscape in Lesotho.

iii. Development and support towards a CoP (Preston, 2007) consisting of educators, learners, researchers, IT specialists and policy makers to inform contextually sensitive ICT integration strategies across all four ecosystems of the Davis' (2018) Arena, i.e. courses, learning institutions, countries, and the world. This can be achieved through collaboration, networking, and partnerships using platforms such as publications, conferences, blogs, wikis to co-construct and disseminate knowledge.

6.4.2 The institutional level

The specific recommendations to NUL, institutions of higher learning in Lesotho and other similar contexts are as follows:

i. In view of inadequate ICT infrastructure and resources across the country and at NUL confirmed (Kvale, 1996) by the participants from the NUL Management, IT specialists, senior administrators, tutors and learners, a contextually-relevant pedagogic model or definition of blended distance learning should comprise a blend of face-to-face, print-based and online instruction. The model should be gradually introduced, taking into consideration the ICT developments.

ii. Blended learning innovations must consider critical success factors such as the learners' behavioural engagement and emotional engagement (Turner, 2014), motivation (Salmon, 2002), accessibility of the LMS and available ICT infrastructure and resources to the tutors and learners.

iii. NUL Management must commit more to the envisioned blended distance learning. The suggested markers and indicators of more commitment must include the development of the NUL blended distance learning policy, increased access of the tutors and learners to technology at NUL indicated by, among others, more investment by NUL on ICT infrastructural updates and resources (e.g. computers, Wi-Fi bandwidth and speed) as well as enhanced digital literacy of the learners, as indicated by adequate induction in their first year of learning through a computer skills course;

iv. Adequate planning by NUL Management comprising similar research projects to this study to inform ICT developments. However, the institutional plan must be communicated well ahead of time, must include explicit expectations of NUL from the part-time tutors, must review the workload to accommodate research activities and incentives for tutors participating in the study;

v. Professional development of the tutors should not be equated to induction to 'Thuto' since it entails development of their TPACK;

vi. Blended distance learning must be well introduced and mandatory. This means that it must not only be formalised through policy development as in other higher learning institutions in developing countries (Boitswarelo, 2009) but it must also be implemented. However, the policy must be well disseminated to the candidates (tutors and learners) prior to their appointment or enrolment with NUL for informed decision-making;

vii. Adequate and well-managed IT support structure (e.g. adequately manned computer labs; IT help desk accessible through landline and mobile phone calls, email, drop-in services, as well as short, focused tutorials where necessary for the tutors and learners must be in place;

viii. Strengthened collaboration of the tutors who teach the same course, beginning from instructional design and planning. Technology affordances such as communication, interaction and collaboration among the tutors should be exploited. However, NUL must consider the ways to provide and manage Internet costs of off-campus tutors;

6.4.3 The course level

The recommendations for policy implications at the course level are as follows:

i. A blended distance learning pedagogic model combining face-to-face, print-based and online instruction (predominantly asynchronous) due to the challenges associated with the Internet and electricity. This can be reviewed in line with ICT developments and feedback from the learners.

ii. Designated times for communication and interaction between the tutors and learners per week. For example, each tutor should advise his/her respective department about a suitable time for student online consultation; and the information must be disseminated to the learners. Such information can be included in the course module and, where necessary, changes can be posted to the relevant groups through 'Thuto' announcement tool.

iii. Enhanced collaboration of the tutors facilitating the same course starting from instructional design, joint online learner-support through reading and posting responses to the question and uploading common resources to be accessed by the learners, thus, creating permanent reference material or learning resources.

iv. Enhanced learner engagement through the design of interactive self-instructional material such as conversational writing style and online activities.

v. The proposed blended distance learning pedagogic model should embed online independent study and study groups.

vi. Enhanced communication and interaction through the tools of 'Thuto' such as the chat room, forums and email.

vii. Collaboration through wiki, available on 'Thuto' though not tested in the pilot study.

viii. A combination of printed (books in hard copy) and online library resources (soft copy).

6.5 Living educational theory

According to Elliott (1991), the qualities that distinguish AR from other types of research in education include an opportunity for the researchers to learn from and to improve their own practice. As an academic at NUL aiming to improve our own practice, I present my living educational theory of adoption of blended distance learning pedagogy and the "implicit and intuitive" knowledge, referred to as personal knowledge (McNiff, 2014, p.37) gained from this work.

Influenced by the principles of communal constructivism (Holmes, 2001) which include collaborative knowledge construction (Givan and Savege, 2010; Holmes, 2001; Leask and Younie, 2001; Meehan, Holmes and Tangney, 2001), I have come to know and better appreciate the value of co-construction of knowledge, as the saying goes: 'unity is strength'! The approach in this action research entailed active involvement and collaboration with the key stakeholders in education (tutors and learners) not only through their participation in online activities and provision of feedback but also through voluntary action to find solutions to the emerging challenges. For instance, amidst the reported inability of smartphones to connect to 'Thuto', one of the learners volunteered to consult an Internet service provider on 'our' behalf. The learner excitedly called me in the evening to share feedback that a particular 'mobile application suite' needed to be installed. The application is described as "a suite of software tools used for designing, creating and maintaining mobile applications (Technopedia, not dated). The service provider installed the software and the learner was able to connect to 'Thuto'. Similarly, one of the Course Tutors consulted a service provider to resolve some problems related to the study.

Through such observation, I know the value of relevant knowledge or awareness of technology affordances to potential users. I have also witnessed how the value can influence attitudes and behaviour of the tutors and learners, hence, the importance of the up-to-date experience to inform the values and attitudes of the intended clientele. I also know the acceptable procedures and strategies for successful and sustainable blended distance learning adoption, from the perspective of the NUL community. This lived experience brings much hope that, through collaborative situated learning, a vibrant learning community (Holmes, 2001; Leask and Younie 2001; and Meehan, Holmes and Tangney, 2001) and a CoP (Preston, 2007) can develop from this community characterised by low digital literacy.

6.6 Final remarks

In agreement with the notion that successful and sustainable blended learning innovations depended largely on the attitudes of the tutors and learners (Raspopovic et al., 2017; Nihuka and Ngimi, 2013; Salmon, 2002; Younie, 2001; Galanouli et al., 2001) my claim to knowledge is that attitudes are best informed by collaboratively constructed situated knowledge and experience of technology affordances. Regardless of social and economic challenges identified in this low economy country (Lesotho), informed by the current and relevant technology experience in teaching and learning, the tutors and learners' recommended adoption and implementation of the envisioned pedagogic model by NUL. Thus, I argue that, irrespective of social and economic statuses of the individuals or countries, technology adoption is value-based. Hence, the importance of adequate, differentiated induction to blended learning innovations based on existing ICT infrastructure, hardware and software as well as the digital literacy levels of the potential users, i.e. tutors and learners.

6.7 Suggestions for future research

This research has the following implications for future research, policy and practice:

Future studies can test the proposed blended distance learning adoption and implementation framework adapted from Graham, Woodfield and Morrison, (2013) in various teaching and learning contexts to determine and monitor progress in transition from traditional pedagogies to *blended learning* or *blended distance learning.* The suggested application or testing of this adapted framework which has been applied to the sub-Saharan context should be extended to the developing countries.

Although TAM was not suited to this study due to the implied low digital literacy which was later evidenced (in this study), the future investigations of technology adoption in higher education institutions of Lesotho, as aligned to technology developments, are recommended.

The focus of this study was on the induction of the learners to the use of technology than the tutors. Future studies in Lesotho and other developing countries should focus on the professional development of the tutors and, in particular, their TPACK. The studies could investigate the contextual knowledge and understanding of accessible technologies and how best they can be exploited to enhance the existing pedagogies.

The replication of this study across NUL, with a balanced focus between the tutors and learners or more focus on the tutors.

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APPENDICES

Appendix 1

Interview Protocol – Lesotho Ministry of Education and Training

The purpose of this baseline study is to explore how the National University of Lesotho (NUL) can adopt and implement Technology-Enhanced Learning and Teaching (TELT) in part-time/Open and Distance Learning (ODL) programmes offered by the Institute of Extra-Mural Studies (IEMS). The questions are mostly informed by the *Survey of ICT and Education in Africa – Lesotho Country Report* (2007).

What is the current total number of secondary schools in Lesotho?

In 2005 Primary Education was free. Up to what level is education free in Lesotho in 2014? _____________

In 2005 there was no explicit independent national policy on ICTs in education. What is the current status?____
____

"Of the total number of schools (about 1,700) in Lesotho, only 20 have electricity" (Isaacs, 2005). What is the current situation? (i.e. how many secondary schools have electricity?

____

____

The National ICT Policy implementation document has indicated that MOET was ahead of the rest of the public sector, e.g. The Demo Project supported by Microsoft and Oracle (Isaacs, 2005). Six high schools fitted with at least 20 PCs, a server and a printer, and a media lab which in some instances included a PC-based kiosk containing health information and satellite television access to education channels. Teachers at the six schools received training and learners have subsequently used the PC labs in the classroom.

Which schools were these?

What is the current status?

Other than these schools, were there any more high schools which have adopted the use of technology?

What kind of skills are offered?

What form of support does the Ministry provide to higher education institutions which use technology to enhance teaching and learning? (e.g. IT support for learners - e.g. Reduced rates)

What is the current situation pertaining to the following specific challenges/constraining features in the use of ICT in education in Lesotho which were identified by Isaacs (2005):

Lack of national infrastructure seriously constraints the use of ICTs in Lesotho's education institutions

While there are attempts at collaboration between Ministries of Education and other ministries, the private sector and civil society institutions, there are no explicit collaborating mechanisms in place

There remains a very limited layer of skilled personnel and champions within ministries to drive the national policy implementation, and often consultants and groups from South Africa are drawn in to support project and programmes

Fiscal resources are lacking

The duties and taxes currently levied on ICT products makes them too expensive

What is your general opinion on adoption and implementation of TELT by NUL?

What is your general opinion on adoption and implementation of TELT in part-time/ODL programmes offered by IEMS?

Are there any critical issues to consider in relation to adoption of TELT which have not been covered in this interview?

Do you have any other suggestions or comments that you would like to make in relation to the study?

Are there any questions that you would like me to answer?

Thank you for your participation in the study!

Appendix 2

Interview Protocol

The purpose of this baseline study is to explore how the National University of Lesotho (NUL) can adopt and implement Technology-Enhanced Learning and Teaching (TELT) in part-time/Open and Distance Learning (ODL) programmes offered by the Institute of Extra-Mural Studies (IEMS). This interview therefore explores technology experiences of students (level of exposure, skills, etc).

Does the school have electricity?

How reliable is it?

Are there any types of technologies used in order to support teaching and learning (e.g. computers, tablets, mobile phones, etc)?

How are they used?

Does your curriculum currently include any courses on technology (e.g. basic skills)? If yes, what does it entail?

Are there any future plans to adopt or improve existing technology initiatives in the school? If yes, what do they entail?

Are there any critical issues to consider in relation to adoption of TELT which have not been covered in this interview?

Do you have any other suggestions or comments that you would like to make in relation to the study?

Are there any questions that you would like me to answer?

Thank you for your participation in the study!

CONSENT FORM

TITLE: Adoption and Implementation of Technology-Enhanced Learning and Teaching in Developing Countries: A Case Study of the National University of Lesotho

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RESEARCHER: Paballo Mokenela
New Hall GS098
Clifton Lane
Clifton Campus
Nottingham NG11 8NS
United Kingdom

Email address: paballo.mokenela2014@my.ntu.ac.uk

Please tick in the space provided to confirm the following:

- I confirm that I understand the purpose of the study and what is being requested of me. ( )
- I understand that the interview will be recorded and transcribed, and that I will have an opportunity to check the interview transcription for accuracy. ( )
- I understand that the information will only be used for purposes of this study. ( )
- I understand that all information will be safeguarded to ensure confidentiality, and I will remain anonymous ( )
- I understand that my participation is voluntary and that I am free to withdraw prior to the interview (in the case of focus group interviews) or within two weeks after the interview (in the case of individual interviews). In such an event, my data will be excluded from the analysis, and the withdrawal will not affect my future professional relationship with the researcher. ( )
- Based on my understanding of the foregoing, I certify that I am willing to take part in the above study. ( )

__________________________ __________________________
Signature of Participant Date

__________________________ __________________________
Signature of Researcher Date

NOTTINGHAM
TRENT UNIVERSITY

Paballo Mokenela

Professor Michael White
Chair of the Joint Inter College Ethics Committee

Direct: +44 (0)115 848 2069
Michael.White@ntu.ac.uk

12 September 2018

Dear Paballo

Thank you for your submission to the Joint Inter-College Ethics Committee (JICEC) requesting ethical clearance for the project entitled: Adoption and Implementation of Blended Learning in Higher Education: A Case Study of the National University of Lesotho. I am pleased to inform you this was approved by the Committee on 4 December 2014. The Committee noted that there were no outstanding ethical concerns that required further discussion or exploration prior to data collection.

The committee would like to wish you well in the completion of your project.

Yours sincerely

Michael J White

Professor Michael White
Professor of Real Estate Economics
Chair of the Joint Inter College Ethics Committee

Appendix 9

New Hall GS098
Clifton Campus
Clifton Lane
Nottingham NG11 8NS
UK

5th January, 2015

The Registrar
National University of Lesotho
P.O. Roma. 180.
Lesotho.

Dear Ms. Mphuthing,

Re: APPLICATION FOR CONSENT TO COLLECT BASELINE DATA

I am hereby seeking permission to collect baseline data to feed into my study proposal. I am a PhD student at Nottingham Trent University (NTU) conducting a study of how the Institute of Extra-Mural Studies (IEMS) at the National University of Lesotho (NUL) can integrate technology into teaching and learning for enhanced Open and Distance Learning (ODL) delivery. The baseline study entails an analysis of national and institutional ICT infrastructure and policies, envisaged NUL ICT strategy, perceptions of NUL administrators/management and IT personnel as well as support structures. Technology experiences of IEMS teaching staff and learners will also be included.

My study proposal has to be submitted for consideration by (NTU) in March 2015. As a result, I intend to collect the baseline data from the 5th to 23rd January 2015 in order to create time to develop the proposal.

I sincerely apologise for submitting my request to collect data at such short notice. The need to conduct the baseline study emerged as I worked on my study proposal and it has mainly been necessitated by limited up-to-date publications on ICT and Education in Lesotho, especially in higher education.

I look forward to your favourable consideration of my request. Attached herewith please find a letter of introduction from NTU Graduate School.

Yours sincerely,

____
Paballo Josephine Mokenela (Mrs)

cc: Director, IEMS

Appendix 12

CATEGORY (Questions asked)	PRIORI CODES	OPEN CODES
Participation in online activities	Read the uploaded resources. Joined discussion on Forums or Chat room. Read and sent emails.	Checked assignments. Helped others to log into THUTO. Read general university announcements
Non-participation in online activities	None.	Unable to access THUTO. No smartphone. Inability of mobile phone to access THUTO. Server problems. Lack of computer skills. "It was not introduced actively since my arrival at the university". Limited time. Email problems.
Benefits perceived or realised	Access to information. Communication with facilitators. Communication with other learners/group members. Acquisition of computer skills. The possibility to study anytime, anywhere. Reduced travel costs.	Reduced communication costs. Relevance to the needs of adults with limited time. Enhances interest to participate. Access to technology on campus – no ICT resources off-campus.
Challenges perceived or experienced	Low digital literacy. Lack of ICT resources off-campus. Limited time for practice. Internet connection/network problems. Costs associated with internet use.	Lack of electricity. Email account problems. Limited ICT resources on campus. Inability to apply the acquired computer skills to a mobile phone
Enabling factors	Availability of ICT resources off-campus. Knowledge/ability to use computers. Support from other learners. Support from facilitators/researcher/ instructional technology lecturer/IT manager.	None.

General feelings about BL	None.	BL is relevant and necessary. More for practice time needed. Facilitates ease of interaction and collaboration. Widens interaction and collaboration. Enhances digital literacy /brings development to the lives of the learners. Cheaper in terms of time and money. Ease of access Promotes motivation to learn. Easy submission of assignments Provides flexibility in instruction. Online instruction more preferred than BL. Feelings not stated.
Suggestions/ Recommendation	None.	BL recommended. More time for practice and access to ICT resources needed. More institutional ICT resources (computers and the internet) needed. Reduction of face-to-face instruction. No suggestions or recommendations made.

A coding frame for the content analysis of the learners' online engagement experience open-ended questionnaire and focus group interview.

Appendix 14

From: [redacted]>

Date: Wed, 24 Feb 2016, 11:29

Subject: Touching Base

To: <Mokenela_pj@yahoo.com>

Mme Mokenela,

You have no idea how you have touched a core within me.

I work as a parttime lecturer in [redacted] department. I also work full time as a lecturer with [redacted].

For the past four (4) years, yes all of four years, I been working without much support, without any formal theoretical background, without much direction, without any formal framework to try adopt ICT and to create a Blended Learning experience for my students. At [redacted] I have outrightly and sternly been discouraged and told to "stop" these attempts. You will be proud to know that I havent stopped one bit!

The NUL has as you indicated in your work, committed to making this a reality. Thus making my work a lot easier now that it has the institution backing. The Thuto Helpdesk and the Unit at Roma have been very very supportive in this regard.

My students in the past year have been toying with Thuto, I have made Thuto a part of their learning experience to such a point that last semester we actually had a formal assessment on the platform. The very first!

Your work Madam will no doubt speed up the adoption of ICT in learning on campus.

In the coming week, [redacted] I have scheduled a series of sessions where all our students [redacted] will spent a few minutes (30 min) before classes resume getting help to register on Thuto. The challenge will remain getting the instructors to also join the migration.

Please forgive me for the apparent rumbling, I am so so very excited about your study and the possibilities it opens for our learners. You have successfully given our spade work the academic approach it badly needs. My hair is on edge, and I got tears in my eyes as I type this email because you are doing so so much to enhance the humble attempts we've been making all this time.

The Adoption and Implementation of BL in Higher education Seminar has truly been a blessing for me. It comes at the right time when we are all grappling with the issues which you so eloquently and accurately outlined, studied, and analysed in your paper.

My view is that we ought to get started, this is the only way adoption and implementation will happen! waiting for all the conditions to be perfect will not help us one little bit. I am the first to admit that the Pedagogical implications as regards quality are paramount for this work to be fruitful, however, the technology exists, let's get our people online, and maybe we can then fix the quality issues as we go along.

Pray that you find something worth your while from this email. I didn't want to monopolise you after your presentation, but this is what I wanted to share with you.

God bless you and your work,

[redacted]

As a side question, do you think I could reference your work to talk to my bosses here at [redacted]. The issues are the same, but I do not have the empirical evidence that you have to enlist their support. That the technology exists, the students are ready and that there is no greater time than now to delve into blended learning!

Appendix 15

A Course Map for redesigning Course AED270-6 to a Blended Distance Learning pedagogy.

PROGRAMME: **Diploma in Adult Education**
LEVEL: **Year II**
COURSE CODE: **AED270-6**
COURSE TITLE: **Introduction to research methods in adult education.**

Course AED270-6 is a year course offered in two semesters of one academic year. The course comprises Module I - Course AED270-3: Introduction to research methods in adult education offered in the first semester; and Module II - Course AED270-3: Introduction to research methods in adult education in the second semester. **Module I** course-mapping was as follows:

INTRODUCTION TO RESEARCH METHODS IN ADULT EDUCATION – MODULE I					
UNIT & TOPIC	**LEARNING OUTCOMES**	**UNIT SUB-TOPICS**	**TERMINOLOGY**	**ACTIVITIES**	**USE OF SMARTPHONE/**
Unit 1 The meaning and characteristics of research	Define the term *research.* Explain the purpose of research. Distinguish between basic research and applied research. Discuss the characteristics of research.	Definition of research. The purpose of research. The aim of research. The characteristics of research.	Data Process Research Researcher Variable	**Activity 1, 2**  **Reading, Computer-Based Learning/ Discussion**	Access digital resources (e.g. NUL Library OPAC, google scholar); write down ideas and notes; interaction with peers (post and read responses from peers).

UNIT & TOPIC	LEARNING OUTCOMES	UNIT SUB-TOPICS	TERMINOLOGY	ACTIVITIES	USES OF SMARTPHONE
Unit 2 The scope and significance of research in adult education.	Explain the scope of research in adult education Illustrate the importance of research in adult education Identify researchable problems within the adult education scope.	2.1 The scope of research in adult education. 2.2 The significance of research in adult education.	Adult education Educational research	**Activity 3, 4 & 5** **Reading, Reflection, & Computer-Based Learning**	Access digital resources; write down ideas and notes; interaction and collaboration with peers. (Chat room, group Forums).
Unit 3 The research process	Identify the steps in research. Discuss key concepts in each of the steps in research. Critically analyse the importance of each step in the research cycle.	3.1 The research process. 3.2 Steps in research.	Hypothesis Research design Research problem *Research variables*	**Activity 6** **Reflection / Computer-Based Learning**	Write down ideas and notes.
				Activity 7 **Group activity/ Video**	Access and watch video clip; write down ideas and notes; group interaction and collaboration through Chat room, Email, Forums.
Unit 4 Research design	Define quantitative, qualitative, and mixed methods. Distinguish between quantitative, qualitative, and mixed methods.	4.1 The meaning of research design. 4.2 Quantitative research design. 4.2 Qualitative research design. 4.3 Mixed methods research design.	Empirical Mixed methods Qualitative research Quantitative research Research methods	**Activity 8** **Reading/ Computer-Based Learning**	Submit answer on Drop Box for private file sharing between instructor and student (e.g. use mobile data – tethering/hotspot – where possible).

	Identify research problems best suited to each of the three research approaches.		Research design		
UNIT & TOPIC	**LEARNING OUTCOMES**	**UNIT SUB-TOPICS**	**TERMINOLOGY**	**ACTIVITIES**	**USES OF SMARTPHONE**
Unit 5 Research methodology	Describe various research methodologies. Demonstrate ability to classify research methodologies under three research designs. Critically analyse the research methodologies.	5.1 The meaning of research methodologies. 5.2 Qualitative research methodologies. 5.3 Quantitative research methodologies. 5.4 Methodologies and mixed methods research.	Dependent variable Independent variable Research methodology Study population Study sample	**Activity 9**  **Reflection/ Computer-Based Learning**	Access Announcements tool for time-critical information.
				Activity 10  **Computer-Based Group Learning**	Interaction, collaboration, online submission of assignments and feedback.
Unit 6 The research problem	Define a research problem. Identify research variables. Formulate a research topic. State a research problem.	6.1 What is a research problem? 6.2 Qualities of a good research problem. 6.3 Factors to consider in selecting a research problem. 6.4 Qualities of a good problem statement .	Research problem Problem statement	**Activity 11 & 12**  **Reflection, Computer-Based Learning**	Write down ideas and notes for face-to-face classroom discussion. Access submission instruction on Announcements tool; Submission on Assignment tool.

UNIT & TOPIC	LEARNING OUTCOMES	UNIT SUB-TOPICS	TERMINOLOGY	ACTIVITIES	USES OF SMARTPHONE
Unit 7 Research questions and Research hypothesis	Differentiate research question from research hypothesis. Discuss the qualities of a good research question and a good hypothesis. Formulate research questions and hypotheses.	7.1 Research questions 7.2 Research hypothesis	Research questions Research hypothesis	**Activity 13 & 14**  **Reading, Computer-Based Learning and Discussion**	Access digital resources; write down ideas and note for class discussion; Online group interaction & collaboration, post group response, read, and respond to views of peers on Forums.
Unit 8 Review of related literature	Define the term literature review. Describe the purpose and significance of literature review. Distinguish between primary sources and secondary sources of literature. Critically review relevant literature to a topic of interest.	8.1 Meaning of literature review. 8.2 The purpose and significance of literature review. 8.3 Sources of literature.	Literature Literature review Primary sources of literature Secondary sources literature	**Activity 15**  **Computer-Based Learning**	Submit assignment to Drop box.
Unit 9 Course summary and revision	Assess your knowledge of research concepts. Apply relevant research skills within the scope of adult education using practical revision activities.	9.1 Summary of the module. 9.1 Revision activities	All unit terminologies	 **Computer-Based Learning and Discussion**	Access digital resources, online discussion with peers, communication and interaction with tutors.