E-Learning Technologies for Open Distance Learning Knowledge Acquisition in Management Accounting

by

TRUST KASHORA

submitted in accordance with the requirements

for the degree of

DOCTOR OF ACCOUNTING SCIENCE

at the

UNIVERSITY OF SOUTH AFRICA

SUPERVISOR: Prof H M van der Poll

CO- SUPERVISOR: Prof J A van der Poll

JULY 2018

ABSTRACT

This research seeks to establish how e-learning may contribute towards knowledge construction for Management Accounting students at the University of South Africa. More specifically, the research is designed to investigate how educational technologies like e-learning may benefit and improve the teaching and learning of Management Accounting at Unisa. Educators need to understand how students learn so that they can establish suitable learning strategies. Studies have shown that generally, e-learning applications are little used, sometimes because of inappropriate content and technologies. Other prohibitive factors are costs, poor or inadequate technology infrastructure and a shortage of human resources. On the strength of a comprehensive literature survey, a framework to address and manage challenging aspects of teaching and e-learning were developed. Problem areas and critical success factors were considered.

The said framework ought to assist with organising complex issues and reveal parts that need further work. The utility of the framework was evaluated through a staged process. First, it was tested and evaluated through the model of a lecture. Secondly, both qualitative and quantitative surveys among university lectures and students were conducted to further confirm the applicability of the framework. Though the outcome of the validations were satisfactory, more research needs to be carried out over a longer period of time in order to determine the scalability of the framework and to remove any inconsistencies. Aspects of the framework could be used to incorporate ICTs, e.g. the use of spreadsheets and the Learning Village into communities of practice.

Keywords: Community of practice, ICT (Information and Communications Technology), Framework, Management accounting, Open and Distance e-learning (ODeL), Teaching, Technology infrastructure and Utility

OPSOMMING

Hierdie navorsing poog om vas te stel hoe e-leer kan bydra tot kenniskonstruksie vir Bestuursrekeningkunde-studente aan die Universiteit van Suid-Afrika. Die navorsing is meer spesifiek ontwerp om vas te stel hoe opvoedkundetegnologieë soos e-leer die onderrig en leer van Bestuursrekeningkunde by Unisa kan bevorder en verbeter. Opvoeders moet verstaan hoe studente leer sodat hulle geskikte leerstrategieë kan ontwikkel. Studies toon dat e-leertoepassings normaalweg min gebruik word, soms omdat die inhoud en tegnologieë nie toepaslik is nie. Ander faktore wat dit belemmer, sluit in onkoste, swak of onvoldoende tegnologie-infrastruktuur en ’n tekort aan mensehulpbronne. ’n Raamwerk om die uitdagings van onderrig en e-leer te bestuur, is op grond van ’n omvattende literatuurstudie ontwikkel. Probleemareas en kritiese suksesfaktore is in gedagte gehou.

Die genoemde raamwerk behoort van nut te wees vir die organisering van ingewikkelde kwessies en toon watter dele verdere werk vereis. Die bruikbaarheid van die raamwerk is deur middel van ’n stapsgewyse proses geëvalueer. Eerstens is dit getoets en geëvalueer op grond van ’n lesingsmodel. Tweedens is kwalitatiewe en kwantitatiewe meningspeilings geloods; sowel universiteitsdosente as -studente is versoek om die toepaslikheid van die raamwerk te bevestig. Alhoewel die uitkoms van die validasies bevredigend was, moet verdere navorsing oor ’n langer tydperk gedoen word om die skaleerbaarheid van die raamwerk te bepaal en enige teenstrydighede uit die weg te ruim. Aspekte van die raamwerk kan gebruik word om IKT’s, bv die gebruik van sigblaaie en die Learning Village, by praktyksgemeenskappe te inkorporeer.

Sleutelwoorde: Praktyksgemeenskap, IKT (inligtings- en kommunikasietegnologie), raamwerk, Bestuursrekeningkunde, oop en afstands-e-leer (OAeL), onderrig, tegnologie-infrastruktuur en bruikbaarheid

ISIFINYEZO ESIQUKETHE UMONGO WOCWANINGO

Ucwaningo lufuna ukuthola ukuthi ngabe ukufunda nge-e-learning noma ngendlela ye-elektroniki kungafaka kanjani esivivaneni ekwakheni ulwazi kubafundi be-Management Accounting eYunivesithi yeNingizimu Afrika noma i-University of South Africa. Ngokuqonde ngqo, ucwaningo ludizayinwe ukuthi luphenyisise ngkouthi amatheknoloji emfundo afana ne-e-learning angaba nenzuzo kanjani kanye nokuthuthukisa ukufunda nokufundisa kwi-Management Accounting eUnisa. Abafundisi kudingeke baqondisise ukuthi izitshudeni zifunda kanjani ukuze bakwazi ukuthola amasu afanele okufunda. Izinhlaka eziningi zocwaningo ezenziwe zibonise ukuthi ngokunabile, ama-application amaningi e-e-learning asetshenziswa kancane, kodwa ngesinye isikhathi lokhu kubangelwa wukuthi kusuke kunengqikithi engahambisani kahle ngokufanele kanye namatheknoloji angafanele. Ezinye izinto eziyizihibe, zindleko, ingqalasizinda ye-theknoloji yezinga eliphansi noma engenele kahle kanye nokusweleka kwabantu abawusizo. Ngokulandela imibhalo efundwe ngokujulile, kwenziwe uhlaka lokubhekana nokuphatha izinselele maqondana nokufunda nokufundisa kwase kwenziwa nge-e-learning. Kubonelelwe nemikhakhe enezinkinga kanye nokubhekana nezindawo ezinomphumela obambekayo nobalulekile.

Uhlaka okukhulunywa ngalo kumele lusize ekuhleleni izinto eziyisixakaxaka kanye nokuveza izingxenye ezisadinga ukuthi kubhekwane nazo ukuzixazulula. Ukusetshenziswa kohlaka kuye kwahlolwa ngezinqubo ezinezigaba. Esokuqala isigaba, siye sathestwa kanye nokuhlolwa ngokusebenzisa imodela yesifundo. Esesibili isigaba, besingesokwenza ama-qualitative nama-quantitative survey kubafundisi baseyunivesithi kanye nabafundi, ukuqinisekisa ukusebenza kahle kohlaka. Ngisho noma ukubheka imiphumela yokuqinisekisa uhlolo ibiyenelisa, kusadingeka ukuthi kwenziwe olunye ucwaningo, esikhathini eside ukuze ukusetshenziswa kohlaka kuye ngokungezeleka ukubandakanya iningi (scalability), kanye nokuqeda izinto ezenza ukuthi kube nokwehluka-hluka nokungahambelani kahle ekusetshenzisweni (inconsistencies). Izingxenye zohlaka zingasetshenziswa ukwengamela ama-ICTs, isib. ukusetshenziswa kwama-spreadsheets kanye ne-Learning Village kulawo maqembu asebenzisa uhlaka.

Amagama abalulekile: Amaqembu asebenzisa uhlaka ukuluthuthukisa nokuluqhubela phambili (community of practice), Amatheknoloji olwazi nokuxhumana [ICT (Information and Communications Technology)], Uhlaka (framework), i-Management Accounting, Izifundo ezivulekile nezenziwa umuntu ekude nesikhungo semfundo ngokusebenzisa inqubo ye-elektroniki [Open and Distance e-learning (ODeL)], Izingqalazizinda zezokufunda, itheknoloji kanye nokusetshenziswa kwayo (Teaching, Technology infrastructure and Utility)

ACKNOWLEDGEMENTS

I wish to express my sincere appreciation and gratitude to every individual who contributed to the successful accomplishment of this thesis.

Firstly, I wish to express my deepest gratitude and extreme thanks to my supervisors, Prof H.M Van der Poll and Prof J.A. Van der Poll from the Graduate School of Business Leadership, University of South Africa. I am extremely grateful for their supportive advice, guidance, and encouragement throughout my DCompt journey.

Secondly, I would like to thank all the Unisa lecturers who did find time for interviews and students who responded to the online survey.

Finally, I would like to extend my deepest gratitude and love to my family for their continuous encouragement and tolerance. I am also indebted to my wife, Phoebe, for her wholehearted encouragement and continuous support in fulfilling objectives.

ABOUT THIS RESEARCH

The researcher used three main application programs during the life-cycle of the study. Yahoo.com was used to send invitation emails to students in the sample as well as receiving incoming responses from participants. Surveyface.com is the application program that administered the online survey; every student was sent a link to this program. Mendeley.com was used to insert citations into the document and to generate a list of references in the bibliography. There were however some references that had to be entered manually. Connectivity was key for the three processes.

LIST OF PUBLICATIONS

The following publications have emanated from this research, and are reflected in the list of references towards the end of this thesis:

[1] Kashora, T., van der Poll, H.M. and van der Poll J.A. 2012. E-Learning Technologies for Open Distance Learning Knowledge Acquisition in Management Accounting. *Conference held in Montreal, Canada. June 2012.*

[2] Kashora, T., van der Poll, H.M. and van der Poll, J.A. 2013. Evaluation of an ODeL Knowledge Acquisition and Construction Framework *Joint International Conference on Engineering Education and ICEE, pp. 360-368.*

[3] Kashora, T., van der Poll, J.A. and van der Poll, H.M. 2014. Evaluating the Utility of a Knowledge Acquisition and Construction Framework for Learning Management Systems, in *Proceedings of the e-Skills for Knowledge Production and Innovation Conference 2014*, pp. 161–172.

[4] Kashora, T., van der Poll, H.M. and van der Poll, J.A. 2016. E-learning and technologies for open distance learning in Management Accounting, *Africa Education Review*, 13(1). doi: 10.1080/18146627.2016.1186863.

[5] Kashora, T. and Kashora, P. 2017. An evaluation of developments in e-learning at Universities in Africa with a special focus on universities in South Africa, Zimbabwe and Kenya. *DEASA Conference, Lusaka, Zambia. November 2017.*

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS AND ACRONYMNS

AAA	American Accounting Association
ACCA	Association of Certified Charted accountants
APA	American Psychological Association
ARPANET	Advanced Research Projects Agency
CA	Chartered Accountant
CAI	Computer Aided Instruction
CAL	Computer Assisted Learning
CBT	Computer Based Training
CD-ROM	Compact disc Read-Only Memory
CERN	Central European Research Network
CIS	Chartered Institute of Secretaries
CMA	Certified Management Accountant
CMS	Course Management System
GPL	General Purpose License
HTML	Hypertext Markup Language
IBM	International Business Machines
ICT	Information and Communication Technology
IMA	Institute of Management Accountants
IT	Information Technology
LMS	Learning Management System
MIT	Massachusetts Institute of Technology
ODL	Open Distance Learning
PHP	Personal Home Page
RSS	Rich Site Summary
SCO	Sharable Content Objects
SCORM	Sharable Content Object Reference Model
Unisa	University of South Africa
USA	United States of America
WiFi	Wireless Fidelity
WWW	World Wide Web
WYSIWG	What You See Is What You Get

CHAPTER ONE: INTRODUCTION

1.1 INTRODUCTION

The World Wide Web (WWW) evolved steadily from roughly 1991 and by 1997, it was beginning to have significant impacts in the development of the Internet (Humphrey & Lee 2004). The terms Internet and Web are sometimes used synonymously and yet the Internet was formalised in 1971 and, the WWW in 1991. The Internet was conceptualised in the military at the Advanced Research Projects Agency (ARPANET) of the Massachusetts Institute of Technology (MIT) (from 1962 to 1966) with the intention of coming up with a global network. The Internet, known as ARPANET, was brought online in 1969 with four connected computers at American Universities (Leiner, Cerf, Clark, Kahn, Kleinrock, Lynch, Postel, Roberts & Wolff 1997). Packet switching formed the basis of these Internet connections (Baran 1994). In Information and Communication Technology (ICT) terminology, packet switching is a network protocol that breaks data into a number of parts, called packages and sends them to the destination where they are reassembled. Some of its key features are that it results in efficient use of network bandwidth, it is more reliable and it is cheaper to build.

Building on the above Tim Berners-Lee at the Central European Research Network (CERN) proposed a new protocol for information distribution in 1989. It became known as the WWW in 1991 (Humphrey & Lee 2004). The WWW project had as its primary aim, to allow all links to be made to any information anywhere. Internet connectivity therefore became ubiquitous even allowing for connection into the classroom. For instance, in 1997 Alan Sangster did research into Web-based accounting education. His findings revealed a growing integration of the Web into accounting education (Champ 1997; Milner, Porter & Hampshire 2016; Parker 2015).

It is from these humble beginnings that online accounting education continues to evolve and grow in tandem with prevailing technological advancements (Boer 2000; Kalogrides & Loeb 2013). This research discusses, investigates and explores how learning technologies may benefit the construction of knowledge in Management Accounting in the open distance space. A framework will also be developed in order to facilitate the organisation and management of the learning process.

The technological developments in e-learning have led to the expectation that technology-based learning would become a dominant paradigm for teaching and learning worldwide (Bates 2005; Henning, Gravett & van Rensburg 2005; Goodfellow & Lea 2007). Ssemugabi and de Villiers (2010) concur that e-learning initiatives are quite widespread; while Herselman and Hay (2003) report e-learning as the fastest growing segment of the corporate Information Technology (IT) market, in constructing systems of knowledge. In the United States of America (USA), the percentage of students in higher institutions of learning doing all their courses online (44%) was projected to rise to 81% by 2014; while the e-learning industry was reported to be worth US$48 billion (Ambient Insight Research 2009).

The statistics on online implementations are widely reported, with some being more positive than others, however generally, new online annual enrolments are higher (at more than 10%) than traditional classroom enrolments (at 2%). The future planned for in terms of pedagogical designs in e-learning has been increasingly becoming the present (Fernández-Manjón, Sanchez-Perez, Gomez-Pulido, Vega-Rodriguez, & Bravo-Rodriguez 2007). Developments are taking place rapidly in the e-learning environment, leading some researchers to label it a revolution (Hadžić 2014; Guri-Rozenblit 2009). The current speed of change means that employees need to be trained continuously in order for companies to avoid the dangers of being out-thought and out-manoeuvred by competition (Piccioli 2014).

A common claim made in the literature is that online learning helps students construct their own meanings and ideas, a factor that suggests an improvement in the quality (and quantity) of learning (Beckman, Bennett & Lockyer 2014; Saito, Takaku, Egusa, Terai, Miwa & Knado 2010). Therefore, the claim that learning technologies offer new possibilities for study and promote the quality of learning is often taken for granted. Hence, the extent to which information and communication technologies (ICTs) can promote knowledge constructivist approaches to learning in Management Accounting may need to be established. Moreover, there seems to be a clear link between the needs and requirements of education and the ability of technology to meet these needs (Laurillard 2002). Laurillard (2002) continues to claim that education is on the brink of being transformed through learning technologies. This is where Management Accounting education can benefit

The layout of the chapter is as follows: Section 1.2 discusses the aim of the research; Section 1.3 portrays the research questions and Section 1.4 poses the research objectives. Section 1.5 discusses the research methodology. In Section 1.6 a short preliminary literature review is given whereas Section 1.7 lists the definitions of terms and concepts. Section 1.8 discusses the assumptions and section 1.9 the limitations. Section 1.10 states the delineations and Section 1.11 the significance of the study. Section 1.12 discusses ethical issues and Section 1.13 discusses the layout of the thesis. This chapter concludes with a summary in Section 1.14.

1.2 BACKGROUND TO THE PROBLEM

Current developments in e-learning can make a positive contribution towards knowledge acquisition and construction in Management Accounting education for open distance students. This is the motivation for this research, which can be divided into three parts:

- The advent of e-learning ought to facilitate the teaching and learning of Management Accounting in the open distance learning (ODL) space.
- E-learning ought to be integrated into Management Accounting curricula in order to enhance a natural progression for the techno-generation student.
- The gap between the skills expected of Management Accounting practitioners in the field and those from management accountants qualifying from institutions of higher learning ought to be reduced.

The above challenges lead to the following problem statement.

1.3 PROBLEM STATEMENT

The high level of awareness in educational technologies does not seem to translate to successful e-learning implementations especially in the discipline of Management Accounting.

The above problem statement lead to a number of research questions (RQs).

1.4 RESEARCH QUESTIONS

The research questions revolve around how the emerging technologies can best be integrated into a packaged solution for Management Accounting students in the ODL space. Therefore the main question is:

RQ – 1 What pedagogical theories and technologies can be employed to enhance ODL knowledge acquisition in Management Accounting education and what technology can be deployed to support that type of pedagogy?

The sub-questions associated with the main one are:

RQ - 2 What are the underlying pedagogical theories for teaching and learning the concepts under consideration?

RQ – 3 How is a Management Accounting course structured for online delivery, allowing for:

- learning scaffolds, and
- maintaining its rigour?

RQ- 4 How can mechanisms for preparing both students and academic staff to use available technologies effectively, be implemented?

In this research a framework to address aspects of the research is developed, and such framework would also have to consider peripheral questions bordering around the central concerns of how to incorporate learning technologies into the acquisition and construction of knowledge systems in Management Accounting education. Knowledge may be defined as “the state or fact of knowing something with familiarity, awareness, or understanding gained through experience or association” (Bray & Els 2007:2). From this, it follows that knowledge systems are systems through which people make sense of and attach meaning to the world in which they live. Subsequently, the above research questions may be unpacked in finer detail into the following ICT and e-learning specifics:

- How can web-based learning become a pedagogical paradigm shift? How can this paradigm shift be achieved in the context of Management Accounting?

- How can Management Accounting learning be facilitated so that students *learn by doing*? Which activities need to be included during the design stage of a Management Accounting course?
- How proficient are the students in the use of the relevant hardware and software? Do the students spend a significant amount of time learning to use the technology instead of learning Management Accounting concepts and principles?
- How can a full integration of IT into the Management Accounting courses be achieved? How are accounting graduates prepared for the computerised demands and expectations of the business world?
- How can Management Accounting educators participate in the design and development of software and material used for teaching issues?
- Can an open kind of pedagogical space be created in the e-learning environment in which students and learning, teachers and teaching and Management Accounting, all take new identities in this (r)evolution?

The above questions may be answered through the objectives of this research.

1.5 RESEARCH OBJECTIVES

The objectives of the study are to:

- Employ pedagogical theories that can enhance ODL knowledge acquisition in Management Accounting.
- Identify the main theories for teaching and learning the concepts under consideration.
- Select and structure a Management Accounting course for online delivery in a manner that allows for scaffolding.
- Prepare both students and academic staff to use available technology effectively.
- Make web-based learning a pedagogical paradigm shift in the teaching of Management Accounting.
- Facilitate Management Accounting learning so that students learn by doing.
- Assess students proficiency in the use of the relevant hardware and software and the time spent on each task.

- Integrate IT into Management Accounting courses in a manner that prepares the accounting graduates for the world of work.
- Participation in the design and development of software and material used for teaching issues by management accountants.
- Create an open kind of pedagogical space in the e-learning environment so that students and learning, teachers and teaching and management accountants all take new identities.
- Develop a framework that can be used to organise and manage the implementation of e-learning.
- Validate the framework through surveys among Management Accounting students and interviews with academic staff.

1.6 RESEARCH METHODOLOGY

This section addresses the research methods that will be employed in order to conduct the study. It will also include the design principles to be adhered to during the design process. Initially, a lime survey was planned for first and second year students in Management Accounting at the University of South Africa (Unisa). Subsequently, an online survey using SurveyFace was designed for the purpose of gathering data to be used in the research. It was also decided to conduct unstructured interviews with lecturers in Management Accounting so as to hear the voices of the people who interacted with the students most of the time. This method was therefore a mixed methods approach with its attendant benefits.

1.6.1 Research design

Mixed research methods will be employed in the study. This method is chosen since the research will involve measuring some variables on the performance of students during the empirical part. Quantitative research tests objective theories by examining relationships between variables, while the qualitative approach will establish the lived experiences and perceptions of students and lecturers in Management Accounting (Creswell 2014).

1.6.2 Population and sample

The population of the research will be all the second year students in a Management Accounting course at Unisa in 2015, from which a sample will be selected. The choice to study Management Accounting (MAC2601) is arbitrary, maybe the researcher has a perceived bias that it is a more challenging discipline than other areas of Accounting. Participants will be selected using random sampling and the sample size will be determined by a power analysis (Creswell 2014). In random sampling, each individual has an equal chance of being selected from the population therefore ensuring that the sample would be representative of the population (Creswell 2014).

1.6.3 Data collection and analysis

Some content in the Management Accounting course will be analysed, as well as an online questionnaire done via Surveyface. E-mail communication will be used to complement the Web-based survey. A pilot study will be used to pre-test the questionnaire. Therefore, an initial survey will be conducted in order to assess the appropriateness of Unisa's e-learning environment, and this will cover a variety of features offered through its computer network infrastructure.

1.7 LITERATURE REVIEW

The literature review involves a discussion of the key topics that make up e-learning. Therefore, the literature review discusses broadly issues which affect learning using new technologies. Some of the topics covered include: online learning; theories of learning; perspectives in Management Accounting; learning communities and the concept of presence; and how they relate to the educational experience.

1.7.1 E-learning: the concept

E-learning may be defined as a form of education via the Internet, networks, or standalone computers. It includes the transfer of skills and knowledge over the network – and it refers to using electronic applications and processes to learn (Bates 2005; Guri-Rozenblit 2009). Amongst others, the processes may encompass:

- computer-based learning;
- virtual classrooms; and

- digital collaboration.

The content for this form of learning is delivered via the Internet; intranet; extranet; audio or video tape; satellite TV; or CD-ROM. Therefore, e-learning is centred in modern ICTs. In this research, e-learning takes this expanded meaning.

1.7.2 The nature and challenges of e-learning

Studies have shown that there is poor usability of e-learning applications, sometimes due to irrelevant content and inappropriate use of technologies (Bates 2005; Goodfellow & Lea 2007; Ssemugabi & de Villiers 2010). Moore, Dickson-Deane, and Gaylen (2011); and van Rooyen (2015) cite the contributory factors as poor or insufficient technology infrastructure or a lack of access to such infrastructures as well as a lack of human resource capacities. Hidden costs in the form of support and maintenance of infrastructure and costs related to the training of staff are the other impediments (Ssekakubo, Suleman & Marsden 2011; Tarus, Gichoya & Muumbo 2015).

Literature on learning and teaching suggests that learning takes place when it is situated in “meaningful and authentic problem-solving activities” (Schank 2005:231). This approach is founded on the principles of learning by doing and experiencing tasks. The concept of learning by doing, also called *experiential learning* is a pedagogical design that stands to optimise learning. The following alternative forms of learning by doing would be quite ideal in foregrounding a base for constructing knowledge systems (Naidu 2006; Carlile, Jordan & Stack 2008):

- scenario-based learning;
- goal-based learning;
- problem-based learning;
- case-based learning;
- learning by designing; and
- role-play-based learning.

Schank (2005) associates successful learning with constant practice. “Practice means endless repetition not just trying something once” (Schank 2005:231). Therefore when learning or doing something, practice is what matters, while feedback and reflection usually follow. Miles, Huberman, and Saldana (2014) acknowledge that experience is

the real teacher and course designers need to design experiences and not just courses. In this way, a platform for the construction of knowledge would be well suited.

Most online learning takes place on the ubiquitous platform of the WWW now popularised as “WWW dot something.” The Web was not applied systematically to education until 1995, however the potential for an educational paradigm shift had already been recognised and acknowledged. What remained was to design new approaches to teaching that would fully exploit the capacities of learning technologies (Champ 1997; Milner et al 2016). Bates (2005), after some dedicated research on Web-based learning, concluded that there was a long way to go before Web-based learning would become a pedagogical paradigm shift. It should however be noted that some progress is being made as evidenced by research and surveys done on implementations of e-learning and blended learning at some African universities (Unwin 2008; Liebenberg, Chetty & Prinsloo 2012; van Rooyen 2015). This research contributes towards shortening the timeline by critically examining how knowledge can best be constructed in an e-learning environment of the Management Accounting discipline.

1.7.3 Evolving technologies in tuition

The teacher has been at the centre of learning from as far back as the time of Moses and Socrates (Bates 2005). The teacher communicated knowledge directly to the student; was the centre of knowledge and the student was the recipient of that knowledge. After the invention of the printing press in the fourteenth century, printed books were used to disseminate knowledge. Teachers now complemented the print material as repositories of knowledge, and schools and colleges were founded to cater for the educational needs of a growing population. The Industrial Revolution reinforced these developments leading to a rapid expansion of schools and universities. Research reveals that distance education can be traced as far back as the 1800s (Burke 1998).

The introduction of the postal service and to some extent the telephone stimulated the start of correspondence education (Bates 2005). Educational radio programmes (around 1924) were followed by television educational programmes (in the 1950’s).This picture is fast changing, driven by technological advancements with the Web becoming the new centre of knowledge. Information technologies have recently

been introduced into the larger society as well as into educational environments with unpredictable effects and outcomes (Howson 2014). The Web site, the cell phone, the iPod, the iPad, the Webcam, Web 2.0, social networking sites such as Facebook and MySpace, Wikipedia and wikis in general, blogs, twitter, YouTube, social tagging sites and cloud computing, are all recent phenomena. Each of these technologies has triggered a new form of communication and social connection, and of information acquisition and sharing in society at large and higher education in particular (Rudestam & Schoenholtz-Read 2010).

Besides the multimodal environment prevalent in most universities, there is actually more writing today (Goodfellow & Lea 2007). The development of new and Web-based technologies has resulted in more writing and more reading, more diversity and more variety in textual practices. Print may well continue to be a major teaching medium due to its ease of accessibility and convenience, while writing is still the dominant mode for the production and maintenance of knowledge, even in e-learning contexts (Bates 2005; Goodfellow & Lea 2007). However, printed material has a major limitation in that it can only carry text, pictures, and illustrations but does not have the flexibility endowed in hypermedia. The flexibility of hypermedia has triggered new innovations for instructional content especially for online and distance students. Web 2.0 tools are in the practice of harnessing collective intelligence (Rudestam & Schoenholtz 2010). The Web supports some forms of social interaction which have in turn become established components of distance education. Web 2.0 technologies also have certain educational qualities: blogging, wikis, e-portfolios, and social networks allow students to clarify concepts, establish meaningful links and relationships and to test their mental models (Laurillard 2002). As a public forum, the process of concept formation, refinement, application, and revision will be transparent to student peers and teachers in a manner that could enhance knowledge construction.

1.8 DEFINITION OF TERMS AND CONCEPTS

E-learning is a form of teaching and learning that includes instruction delivered via a broad variety of electronic media and e-learning artefacts, including the Internet/intranet/extranets, Web-based learning, satellite broadcasts, video/audio tape or DVD, multimedia CD-ROM, online instruction, and traditional computer assisted learning (CAL) (Ssemugabi & de Villiers 2010).

Constructivism is a theory of knowledge that argues that humans generate knowledge and meaning from an interaction between their experiences and their ideas. Knowledge becomes personal and embedded within a context relevant to the student's own life and experience (Bates 2005).

Open Distance Learning (ODL) refers to the linking of a teacher and students in several geographic locations via technology that allows for interaction (Garrison & Cleveland-Innes 2005).

Pedagogy is the science of teaching young students as opposed to andragogy, which is the science of teaching adult students (Moore 1989; Sher 2009).

E-learning technologies is a range of technologies for gathering, storing, retrieving, processing, analysing, transmitting and presenting information which is practically indispensable in the delivery of contemporary education (Howson 2014).

1.9 ASSUMPTIONS

The following assumptions will be operational in conducting this research.

- The levels of computer literacy for both lecturers and students will not impede effective implementation of e-learning.
- All participants will have access to a computer/laptop/tablet which can connect to the Internet and the Unisa databases.
- Wi-Fi and network connections will be stable and there will be no disturbances due to power or system failures.
- Some critical content in Management Accounting will be posted on the Unisa website.
- Participants will be thoroughly familiar with the *my*Unisa e-learning environment.

1.10 LIMITATIONS

The main limitations will be around issues of reliability and validity. Reliability is concerned with dependability or consistency of measurement, while validity suggests truthfulness. For instance, a faulty measuring instrument will not give reliable measurements and this can become a limitation to the study. There is, therefore, a

need to validate the measuring instruments in the study so as to mitigate the limitations.

E-learning is currently a popular and fast-changing research topic, therefore there is the possibility of replication of previous results or not covering adequately the current issues.

The period of study is limited to the years 2015 and 2016. With respect to the survey, the sample will be drawn from students currently registered as second year students in the Management Accounting course (MAC2601) at Unisa in 2015.

1.11 DELINEATIONS

This study has the following delineations:

- It is delineated to students in the MAC2601 course at Unisa.
- It is delineated to lecturers at Unisa who teach MAC2601.
- The sample size will be calculated using a power analysis instrument.

1.12 THE SIGNIFICANCE OF THE STUDY

This study is expected to be significant to users of e-learning, researchers, and policy-makers of training and learning programmes.

- The study will survey the appropriateness of the *my*Unisa environment for e-learning and teaching and make recommendations which should benefit practice.
- It is anticipated to contribute to the knowledge base in the field of Management Accounting research.
- Some features may test some pedagogical designs on e-learning and hence contribute towards the utility of the designs.
- This can act as a base for further studies on online Management Accounting education.
- The findings of the research may encourage policy-makers to implement e-learning methodologies in their institutions.
- This research is significant because of its efforts to address the concerns associated with online education.

1.13 ETHICAL ISSUES

Ethical considerations will be taken into account when planning and conducting this research. This is consistent with what Creswell (2014) suggests, namely, that researchers should protect their research participants, develop a level of trust with participants, and promote the integrity of research and to guard against misconduct.

1.14 LAYOUT OF THE THESIS

CHAPTER 1: INTRODUCTION

Chapter one will discuss the background to the study and present the research questions.

CHAPTER 2: LITERATURE REVIEW

The literature review chapter highlights discourses and trends in the use of ICTs in teaching and learning. It goes on to reveal some of the grey areas in this field and points at possible contributions of the current study in bridging this knowledge gap. It also contributes to the ongoing debate on the topic and in the process, fills gaps in prior studies (Creswell 2014).

CHAPTER 3: METHODOLOGY

Chapter 3 covers the research methodology used in the study and the reasons for choosing the methodology. The research methods employed will be discussed in this chapter.

CHAPTER 4: PRELIMINARY E-LEARNING FRAMEWORK

Chapter 4 discusses a preliminary e-learning framework which was branded the knowledge acquisition and construction framework. The design of the framework will be informed by the literature, especially the one that relates to the teaching and learning of Management Accounting in the open distance space.

CHAPTER 5: LEARNING MANAGEMENT SYSTEMS

Chapter 5 compares and evaluates three LMSs and attempts to establish how a framework can contribute to the design of LMSs. Thus LMSs are defined, and their involvement in academia is focused on.

CHAPTER 6: CONCEPTUAL EVALUATION

Chapter 6 will validate the framework to establish its utility with respect to online and e-learning for Management Accounting.

CHAPTER 7 QUALITATIVEAND QUANTITATIVE EVALUATION

Chapter 7 presents data from the interviews and the online survey. The interview data will be processed qualitatively while the survey will be processed quantitatively.

CHAPTER 8: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS.

Chapter 8 presents the findings of the study, a discussion of these findings and give a conclusion based on the findings as well as recommendations for future work in this area.

1.15 SUMMARY

The chapter discussed how the onset of the WWW impacted developments in technological education. Technological challenges that were encountered during the study become the subject of this research. Information revealed in the literature included the need for experiential learning for the students, and a lack of ICT infrastructure for the students and generally resource constraints during the learning process. An effort was made to highlight how the emerging learning technologies might complement the traditional approaches of teaching and learning.

In the next chapter, the literature sources consulted will be discussed, especially pointing out their relevance and effect on e-learning.

CHAPTER TWO: LITERATURE REVIEW

2.1 INTRODUCTION

In the previous chapter the discussion revolved around the development of the Internet and the WWW, and the subsequent entry of these technologies into accounting education. This literature review discusses the theoretical and contextual foundations on which this research is based. The chapter explores several topics that are significant to this study. These include distance education; e-learning; Management Accounting; the need for a framework; constructivism; scaffolding; learning communities; cognitive presence; social presence and teaching presence; and interaction among many others.

The layout of the chapter is: Section 2.2 discusses distance education especially the ODL option. Section 2.3 introduces e-learning and attempts to distinguish it from online learning, which is covered in Section 2.4. Perspectives of education online are portrayed in Section 2.5 and it explores the incorporation of online education into accounting. Section 2.6 gives a brief history of Management Accounting while the challenges of Management Accounting are covered in Section 2.7. The changing focus of educational technology is discussed in Section 2.8 whereas Section 2.9 portrays the models of frameworks. Section 2.10 discusses theories of learning which include behaviourism, cognitivism, and constructivism followed by the concept of scaffolding.

Learning communities are discussed in Section 2.14, cognitive presence in Section 2.15, social presence in Section 2.16, and teaching presence in Section 2.17 and finally interaction in Section 2.18. The chapter concludes with a summary in Section 2.19.

2.2 DISTANCE EDUCATION

Distance learning is defined as education in which the teacher and student are physically separated during a significant part of the instruction (Burke 1998). However, today's ODL may be defined as education in which the student and instructor, while physically separated, are intellectually connected via technology. ODL may also be referred to as Open Distance e-Learning (ODeL) especially, if e-learning constitutes part of the delivery mode. The term e-learning refers to a wide variety of experiences,

all broadly involving the use of technology to help people learn remotely (Nelson & Winter 2010).

The increasing popularity of the Internet has seen a steady growth in distance education especially in the developed world (Moore et al 2011).

For instance, about half of American colleges and Universities offer ODL courses. There is some convergence between distance learning and e-learning in terms of pedagogy as evidenced by the increasing trend towards more online courses over fewer print-based courses (Bates, 2005). Therefore, the evolution of technologies for distance learning has been characterised with convergence. Stand-alone systems have converged into the Web, while modes of face-to-face and distance education have converged into blended learning. An alternative to e-learning is called “blended learning” where students are taught using both online learning and the traditional face to face contact. Garrison and Vaughan (2008) defined blended learning as the thoughtful fusion of face-to-face and online learning experiences. A number of distance Universities offer their teaching fully online. Examples of some of these universities are the Open University of Catalonia in Spain, University of Phoenix and Maryland in the USA, University College Tec de Monterrey in Mexico and Athabasca University in Canada.

2.3 E-LEARNING

The term e-learning refers to a wide variety of experiences, all broadly involving the use of technology to help people learn remotely (Nelson & Winter 2010). E-learning can be very demanding since students do a lot of the learning and research themselves, which tends to be beneficial to deeper understanding (Nelson & Winter 2010). Learning officers should enlist the support and buy-in of line managers so that they actively encourage new ways of learning in an organisation. Social networks facilitate online peer-to-peer learning and students can access the opinions of experts very easily through blogs, chat-rooms, email, and video. This is a form of e-learning which can be task-specific (Carabajal, LaPointe & Gunawardena 2003; Goldin & Katz 2009).

2.4 ONLINE LEARNING

Online learning is known to have started in the 1980's whilst e-learning does not have its origins fully disclosed (Moore et al 2011). E-learning probably had its origins in the 1980's as well. Authors and researchers do not provide clear definitions of the terms online learning, e-learning and web-based learning, and as a result, these terms sometimes tend to be used synonymously (Moore et al 2011). The common aspect about these terms is that they provide a learning opportunity for individuals. Garrison and Cleveland-Innes (2005) describe online learning as access to learning experiences via the use of some technology (Moore et al 2011). Garrison (2003; and Goldin & Katz 2009) associates online learning with connectivity, flexibility and its ability to promote varied interactions, whereas as Garrison and Cleveland-Innes (2005) describe online learning as being wholly online learning. This would suggest that online learning is a subset of e-learning (that is, online learning constitutes a smaller domain of e-learning). Online learning is also said to be the newer version of these variations of learning (Moore & Kearsley 2012).

The integration of technology into society has been observed as the primary driver for the development of online courses. Eight reasons are identified to explain why academia should offer online courses (Murray, Perez, Geist & Hendrick 2012):

- Online courses provide more opportunities to create active learning environments, address the learning styles of today's technology connected students,
- They foster a greater variety of experiences outside the classroom, teach students how to do independent research,
- Higher education is made more accessible to students,
- Attending university or other institutions of higher education is made more affordable; students are taught about making ethical choices,
- Create online courses that meet high quality standards for teaching and learning.
- Multimedia instruction (text, audio, video, and images), which has been identified as an important element of student satisfaction in an online environment, is facilitated through online teaching.

- Effective online learning will be a result of a well-planned instructional design effort that meets pedagogical needs (Murray et al 2012). Much research has been done in this area.

From the above it follows that content delivered in an online course needs to be complete, relevant, and accurate; the detailed content should include learning activities, assessment requirements, and supporting materials.

The evolution of Learning Management Systems (LMSs) has provided an infrastructure that support online course offerings (refer Chapter 5). The quality and user experiences (utility and ease of use) of LMSs contribute to the ultimate success and overall satisfaction of an e-learning course. LMSs have made it easier to develop online courses that incorporate a variety of learning resources (Bri, García, Coll, & Lloret 2009).

2.5 PERSPECTIVES OF MANAGEMENT ACCOUNTING EDUCATION ONLINE

According to Orapin, Gray, and Williams (2007), there is a scarcity of both empirical and descriptive accounting-based research especially in online education. It is therefore the aim of this study to make a contribution towards filling that gap. Some findings on research conducted in the field of accounting reveal that accounting students were practical in their approach. They want to determine how a system works and how it will be useful to them. They also prefer discovery-type inquiry and find an interactive style as the preferred instructional method (Novin, Arjomand & Jourdan 2003; Kolb & Kolb 2008; Calvert, Kurji & Kurji 2010). The same findings further established that accounting students learn by doing, hence the need to allow them to work on problems and cases that evaluate alternatives and to arrive at answers logically. Understanding how students learn constitutes a crucial part of selecting suitable teaching strategies (Beckman et al 2014).

Efforts to incorporate computers into accounting education emerged after the invention of the personal computer (PC). Cramer (1996) argued that the teacher alone could no longer manage the large numbers of students, but needed the aid of the computer in teaching a (e.g.) Management Accounting course. As a result, he pioneered some research into the teaching of Management Accounting using an IBM 1410 computer. Early critics of the effect of computers in enhancing learning made reference to

Clarck's (1983) mere vehicles argument, that media in instruction can be compared to vehicles that deliver groceries but do not cause changes in the nutrition; instead, he suggested that media are mere vehicles that deliver information, however it does not influence students' achievement in accounting.

One of the problems was a lack of an established theory about how computers could enhance accounting education (Wade 1999). The American Accounting Association (AAA) (1985) committee studied the integration of microcomputers into a Financial Accounting curriculum and concluded that computers could be part of accounting curricula. However, they noted that inappropriate use of computers may lead to the detriment of learning accounting, especially if the student spends a significant amount of time learning to use the hardware and software instead of learning accounting.

The growth in online programmes spans most disciplines in US Universities, though the number of accounting courses offered online is lower than the online offerings of other business disciplines. National publishers like Prentice Hall and Irwin McGraw Hill provide distance-learning services, which include online support for accounting classes to all students and professors (Dosch 2010). Evidence, on the contrary, suggests a growing gap between IT skills demanded of management accountants and those provided by higher education. A full integration of IT into Management Accounting courses may well enhance a more effective management accountant practitioner as compared to one without such integration (Chandra, Cheh & Kim 2006). It is an expectation that e-learning will bridge this gap for management accountants engaged in open distance learning. In Australia, candidates who studied for a Management Accounting analysis module were able to choose to do this module via the Internet during Term 2 of 2010 (Dosch 2010). Management Accounting education can embrace the emerging technologies into its new pedagogical approaches.

Pedagogical applications of software in accounting education can be traced to 1981, after the IBM PC was introduced. This was the time that accounting researchers examined computer applications in accounting pedagogy (Lin & Smith 2006). Accounting educators also designed a variety of materials for teaching issues. The accounting academic community acknowledges the pedagogical importance of such software in accounting education (Lin & Smith 2006). There may be a need, therefore, for accounting educators to be actively involved in the design and development of pedagogical software applications.

Some advantages of distance learning and benefits of online learning are (Pearson 2010; Moore & Kearsley 2012):

- Convenience
- Improved learning opportunities
- Self-paced learning
- Opportunities for collaboration
- Learn anywhere and anytime – ideal for professional training needs e.g. Chartered Accountants (CA's), Certified Management Accountants (CMA's), Association of Certified Chartered Accountants (ACCAs), and Chartered Institute of Secretaries (CIS).
- Cost savings through the elimination of travel expenses.
- Ease of access to the latest information.
- A less intimidating environment than a face-to-face one.
- Access to rural locations as well as a cut across geographical barriers, thereby creating an ability to network nationally and internationally.
- Environmental friendliness, owing to less travel. This implies less pollution leading to reduced costs.

The advantages and benefits of online learning are numerous, and all are worth considering. Many predictions about the effects of the new learning technologies on higher education were based partly on incorrect assumptions; or simply did not happen. Thomas Edison predicted in 1922 that the motion picture would revolutionise education, while in 1945, William Levenson predicted the same for radio and to date, the introduction of ICTs into education has not yet revolutionised education (Bates 2005; Guri-Rozenblit 2009, Nisar, Munir & Ali shad 2012). The impact of the new technologies on learning and teaching is still unclear, and open to much debate. Sir Arthur Clark claimed that humanity tends to overestimate technology in the short-term, yet underestimate it in the long term (Guri-Rozenblit 2009). Guri-Rozenblit (2009) suggests that maybe assessing the effect of new technologies on higher education environments may only be possible after ten to twenty years from now. Guri-Rozenblit (2009) however, makes observations relating to how new technologies have affected either directly or indirectly the study process in academic settings. The affected areas are:

- academic administration and management;
- libraries organisation;
- research networks;
- initiation of new fields of study (technology-based approach to studying Management Accounting would be one of them) and,
- physical infrastructure of the study environments.

The new technologies may affect the study processes in a variety of ways, some of which might not be envisaged now.

2.6 MANAGEMENT ACCOUNTING

Management Accounting concepts can be traced back to the beginning of the Industrial Revolution, and by the late 1940's this discipline was well established (Maher 2000). At Harvard, the faculty introduced Management Accounting into the curriculum soon after World War II (Maher 2000). The faculty at MIT started a similar course about the same time. Management Accounting courses concentrated on managerial and behavioural issues. The changes in Management Accounting and research paid greater attention to decision-making and planning and control, and less to product costing (Maher 2000). The period from 1983 to the present saw the introduction of topics like activity-based costing (ABC) and Earned Value Analysis (EVA), as well as topics such as the balanced scorecard (BSC) and target costing.

Technology has had a great impact on Management Accounting. For instance, technology now enables managers to do for themselves what accountants have done for them in the past (Maher 2000). Fifty years ago, an accountant was skilled at manipulating and processing numbers, however today, every manager can do this on a desktop computer running spreadsheets and database software.

2.7 CHALLENGES IN MANAGEMENT ACCOUNTING

The teaching of Management Accounting started in the 1950's with a strong focus on decision-making processes as compared to the conventional cost accounting activities, which had a focus on inventory valuation. Therefore, Management Accounting assumed its early identity guided by this focus (Maher 2000). Management Accounting is about managing internal operations to optimise organisational

performance through adding stakeholder value. The main difference between cost accounting and Management Accounting was that cost accounting texts dealt entirely with numbers whereas Management Accounting recognises that human beings use those numbers (Boer 2000; Brewer 2008).

Some of the specific challenges within the Management Accounting environment include the following (Maher 2000):

- Higher Education Institution's leavers find it difficult to get employed as a management accountant.
- Management accountants have a labelling dilemma in the sense that in business schools, the discipline is called Management Accounting while in the business world it is referred to as corporate finance or financial consulting.
- Management Accounting topics in practice differ from those in academia. However, it appears that research and practice have been the main drivers of the Management Accounting growth.
- The downsizing of the accounting function in organisations in general is a possible threat to the traditional role of accounting. Technology may be a contributory factor.
- Despite significant changes in the business environment, accounting curricula have largely remained static (Siegel, Sorensen, Klammer & Rightermeyer 2010). The accounting curricula and the education of students need to reflect the changing dynamics of the business environment. Educational technologies, therefore need to reflect and embrace new realities in Management Accounting curricula.

Naturally, the challenges within Management Accounting need to be appreciated fully if one is to make sufficient progress in the field.

Management Accounting educators require students to work in groups, which tends to increase their ability to work in teams on the job. They require students to do presentations in order to improve their presentation skills. In Management Accounting, there is also a need to teach problem-solving skills and the organisational context in which economic activities are conducted (Maher 2000). This would prepare the students better for the world of practice. Lastly, is the need to close the gap between information and communication technologies and strategic decision-making

processes within organisations. Learning technologies have the potential to make a significant contribution in this regard (Moore & Kearsley 2012).

Dosch (2010) argues that a successful career as a management accountant requires an ability to:

- clearly and accurately complete financial analyses; and
- effectively communicate the results of financial analyses to upper management and cross-functionally within an organisation.

The economy is changing, the technology is changing, the textbooks are changing, the professional organisations are changing, and the subject matter of Management Accounting is changing (Nelson & Winter 2010; Beckman et al 2014).

Boer (2000) suggests that the modern Management Accounting teacher should know how to incorporate spreadsheet models, graphical images and video into the classroom and how to construct Web pages for student references outside the classroom. Herdan, Neri and Russo (2017) further suggests that the modern management accountant needs to be well prepared for the technology word. Singer and Wiesner (2013) has reported top skills for its members as computer and technology literacy; and fluent and effective speaking; and communication.

Technology seems to be the primary driving force for future changes within Management Accounting (Maher 2000; Moore & Kearsley 2012). This research attempts to explore and investigate how educational technologies can bring changes that benefit Management Accounting curricula. Technology is able to do what accountants used to do for their managers in the past. The computer has taken over the computational skills of the traditional accountant. A value-creating Management Accounting system might directly support decisions of managers as they work to implement strategy. The adoption and adaptation of e-learning could provide a possible solution to some of these challenges. The following section gives a bird's eye view of the changing focus of educational technology over the past forty years.

2.8 THE CHANGING FOCUS OF EDUCATIONAL TECHNOLOGY

Fernández-Manjón et al (2007) argues that societies that do not understand their history are likely to repeat mistakes of the past. Therefore, there may be a need to make the history of the development of technology-enhanced learning more widely available in order to avoid such mistakes within communities. For the past forty years, educators and trainers at all levels of Education, Business, Training and the Military made use of computers in different ways to support and enhance teaching and learning (Champ 1997; Milner et al 2016). It is these technological advances in computers and networks that have facilitated improvements in e-learning (Fernández-Manjón et al 2007). Table 2.1 depicts this historical detail in that it shows the changing focus of educational technology over this period.

Table 2.1: Changing focus of educational technology

Era	Focus	Educational characteristics
1975 - 1985	Programming, Drill & Practice, Computer – Assisted Learning (CAL)	Behaviourist approaches to learning and instruction. Programming used to build tools and solve problems
1985 – 1990	Computer-Based Training Multimedia	Use of older CAL models with interactive multimedia courseware: Passive student models dominant; constructivist influences begin to appear in educational software design and use.
1990 – 1995	Web-based Training	Internet-based content delivery: Active student models developed. Constructivist perspectives common. Limited end-user interactions
1995 – 2005	E-Learning	Internet-based flexible courseware delivered, increased interactivity; online multimedia courseware; Distributed constructivist and cognitivist models common. Remote user to user interactions.

Era	Focus	Educational characteristics
Wade (1999); Bates (2005); Goodfellow & Lea (2007); Schank (2005)	Web 2.0 technologies also have certain educational qualities that could enhance knowledge construction.	Inappropriate use of computers may be a detriment to learning accounting if students spend more time learning to use the hardware and software instead of learning accounting The study may shorten the timeline for Web-based learning to become a pedagogical paradigm shift

Source: *Adapted from Fernández-Manjón et al (2007)*

The changing focus of educational technology over the past forty years was captured in Table 2.1. These historical changes seem to be the key drivers in this focus. As depicted in the table, e-learning was found within this realm.

Suppes (1966) did some pioneering work in Computer Assisted Instruction (CAI) as early as 1971 through a computer system called PLATO. Therefore, two decades before the WWW came on the scene, the PLATO system pioneered online forums and message boards, email, chat-rooms, instant messaging, remote screen sharing, and multiplayer games leading to the emergence of what was perhaps the world's first online community (Wolley 1994). The commercialisation of PLATO gave rise to today's LMS such as Blackboard (in 1997) and WebCT (in 1997). Some of the more popular LMSs today are Moodle (in 2002), Sakai (in 2003) and Desire2Learn which largely came into existence around the period 1997 to 2004 (Dahlstrom & Bichsel 2016).

2.9 THE MODELS OF FRAMEWORKS

The literature on e-learning has described what the teacher could do or has done online (Gilbert, Morton & Rowley 2007), however it does not do the same for the student experience of these activities. There is now a considerable body of knowledge about e-learning; books, refereed and professional journal articles and reports and other resources and support material for learning (Gilbert et al 2007). This research proposes the design of a Knowledge Acquisition and Construction Framework. The framework will be designed based on information synthesised from the literature. This

is consistent with the literature, which documents a number of implicit and explicit frameworks that were designed to inform e-learning practice (Gilbert et al 2007).

Omona, van der Weide and Lubega (2010) and Haythornthwaite and Andrews (2011) have done work on generic frameworks that support good e-learning environments, while other researchers have focused on specific aspects of e-learning. All these efforts should be complementary. Some of the topics, which are usually explored, include online communities, e-assessments, factors that influence students' use of online learning, e-learning dialogues, and the social dimension of online learning (Gilbert et al 2007).

The literature raises concerns that our knowledge regarding e-learning is limited because of the lack of a scientifically credible evaluation and an absence of an understanding of the quality standards for good e-learning resources (Gilbert et al 2007). Others claim that it is not yet clear how e-students perceive e-learning environments and whether they assist or hinder students in their learning efforts (Gilbert et al 2007). Some reports claim that e-learning fails to live up to expectations (Bates, 2005; Saito et al 2010). It would be significant to focus attention on the student experiences of e-learning, and to listen to students' voices as we seek to extend our knowledge of e-learning.

2.10 THEORIES OF LEARNING

In order to understand how students learn, we need to understand and appreciate three models of learning, namely, the behaviourist, the cognitivist, and the constructivist models (theories).These theories of learning are discussed next.

2.10.1 Behaviourism

Behaviourism focuses on observable behaviour. Most work on behaviourism has been through experimental studies with animals like dogs (Pavlov 1902), rats, pigeons and other animals. During the experiment, positive behaviour is rewarded whereas negative behaviour is punished. In behaviourism, learning is to show a more or less permanent change in behaviour while learning for a constructivist is to see the meaning or significance of an experience or concept (O'Neill, Moore & McMullin 2005). Behaviour theorists define learning as the acquisition of new behaviour. According to this theory, animals and people are biologically wired so that a certain stimulus will

produce a specific response. A good example is Pavlov's observation (above) that dogs salivate when they eat or see food.

Operant conditioning occurs when a response to a stimulus is reinforced. When a reward or reinforcement follows the response to a stimulus, the response becomes more likely in the future. Skinner (1953) used reinforcement techniques to teach pigeons to dance and bowl in a mini-ally. Behaviourism works well with practice sessions like training, as found in the US training world. Behaviourism has also been successful in computer-based training (CBT), where emphasis on repetition and practice may be required. It has however been criticised for not allowing creativity and independent learning and, therefore, not being suitable for higher-level learning. Teachers, who reward or punish student behaviours, usually use behaviourism.

Carlile et al (2008) has summarised certain attributes of Behaviourism as is shown in the following two tables.

Table 2.2: Key Principles of Behaviourism

Principle	Description
Reinforcement	Positive or negative feedback which will lead the student to form a strong association (carrot & stick)
Contiguity	The more immediate the feedback the stronger the association (strike while the iron is hot)
Repetition	The more frequent the stimulus-response the more likely is the desired outcome (practice makes it perfect)
Variation	Varying the pattern of the stimulus generalises the response (the more the merrier)
Intermittent Reinforcement	Not rewarding the response every time is found to be more effective than constant (keep them guessing)
Extinction	If the stimulus-response bond is not reinforced the association will die (use it or lose it)

Source: *Carlile et al (2008:9)*

Table 2.3: Implications of behaviourism for practice

Implications of behaviourism
List the learning outcomes (Bloom's Taxonomies show how these can be categorised)
Assessment must be based on these learning outcomes and nothing else
Break the material down into small units
Carefully sequence these units according to the desired learning
Present the rules for learning the topic
Ensure that the student actively responds (does things)
Provide opportunities for frequent student feedback
Reinforce correct behaviour with immediate rewards

Source: *Carlile et al (2008:10)*

Table 2.2 describes how one needs to respond in order to achieve reinforcement, contiguity, repetition, variation, or extinction. These principles may be used to encourage desirable behaviourism outcomes. The guidelines in table 2.2 are helpful to any instructor since these have been observed to work over time. Table 2.2 can be used in conjunction with Table 2.3 in the sense that careful planning (e.g. items in table 2.3) that is used in conjunction with Table 2.2 guidelines should benefit the learning process.

2.11 COGNITIVISM

Cognitive science came about as a response to behaviourism. Behaviourism was heavily influenced by the works of Pavlov and Skinner. Piaget's cognitive developmental theory and Vygotsky's sociocultural cognitive theory dominated cognitive science. Cognitive Psychology focuses on the study of how people think, understand, and know. According to O'Neill et al (2005), learning occurs when new knowledge is acquired or existing knowledge is modified by experience. The main issues studied and discussed by cognitive psychologists are:

- Cognitive theories present a positive view of development, emphasising conscious thinking.

- Cognitive theories (especially Piaget's and Vygotsky's) emphasise the individual's active construction of understanding.
- Piaget's and Vygotsky's theories underscore the importance of examining developmental changes in children's thinking.

Research in cognitive science confirms that knowledge obtained through activity is more useful than knowledge obtained through memorisation (O'Neil et al*,* 2005).

2.12 CONSTRUCTIVISM

Constructivism or social constructivism is the preferred theoretical approach in both qualitative research and online education (Creswell, 2014; Payne 2009). To Denzin and Lincoln (2012) constructivism is a way of thinking, and yet to scholars like Onwuegbuzie and Leech (2010:35), it is a "fashionable and fruitful" paradigm. They further view constructivism as a perspective in which reality depends on the observer. In pedagogy, the term constructivism applies to learning theory, teaching techniques or the general pedagogical approach (Payne 2009; Creswell, 2014). Constructivist pedagogy should however acknowledge the knowledge, attitudes and interests that students bring to the learning situation in order to construct their own understanding (Payne 2009). Constructivism is seen as a means to foster active learning and encourage the co-creation of knowledge (Payne 2009; Creswell 2014). Information technologies and e-learning are therefore the conduit through which constructivism has been introduced into higher education and in schools (Payne 2009).

In social constructivism, individuals develop subjective meanings of their experiences (Creswell 2014). The goal of a qualitative research is to rely as much as possible on the participants' views and perceptions of the situation being studied. The questions are designed in a manner that allows participants to construct the meaning of a situation. Questions become more open-ended, and the researcher listens carefully to what people say or do in their life settings (Creswell 2014). Constructivist researchers also often address the processes of interaction among individuals (Sher 2009).

A constructivist epistemology and ontology places priority on the phenomena of study and sees both data and analysis as being created from shared experiences and relationships with participants and other sources (Denzin & Lincoln 2012). Researchers' differing ontological and epistemological positions may lead to different

research approaches towards the same phenomenon. Our realities are mediated by our senses; this suggests that reality is individually constructed. The construction of meaning (epistemology) implies the construction of a meaningful reality (ontology) (Creswell 2014).

Constructivism is, therefore, closely related to Interpretivism in that interpretivism addresses essential features of shared meaning and understanding, while constructivism extends this concern with knowledge as produced and interpreted (Denzin & Lincoln, 2012). In this research, it is expected that individuals construct their own knowledge within their learning environment, which is the *my*Unisa LMS; and the outcome is in turn influenced by their prior knowledge and understanding. The researcher is guided by a constructivist epistemological discourse (see Figure 4.1).

In the learning environment, there is an intimate relationship between the researcher and what is being studied, while the students can describe their unique individual experiences in the learning process. The *my*Unisa e-learning environment allows the researcher to observe, investigate, and understand the learning process, and to gather and document the students' experiences using open-ended interviews and open-ended observations as well as an online questionnaire (Myburgh & Sithebe 2006).

2.13 SCAFFOLDING

The Knowledge Acquisition and Construction Framework proposes to adopt the concept of scaffolding during the implementation stage. The reason being that, educators and researchers have used the concept of scaffolding to describe and explain how adults and other peers can guide children's learning and development (Verenikina 2008). Scaffolding is the process where teachers use particular conceptual, material and linguistic tools and technologies to support student learning. In other words, the term scaffolding is used to capture the nature of support and guidance in learning that can assist a teacher's pedagogy.

Some researchers define scaffolding as a changing quality of support over a teaching session in which adults adjust the assistance they provide to fit the student's current level of performance. More support is offered when a task is new whilst less help is provided as the student's competence increases, hence some of the benefits of scaffolding include the following (Verenikina 2008):

- Enables the students to carry out the task which they would not have been able to manage on their own,
- Brings the student to a state of competence which will enable them eventually to complete such a task on their own, and
- Is followed by evidence of the students having achieved some greater level of independent competence as a result of the scaffolding experience (Verenikina 2008).

The above views are consistent with the Zone of Proximal Development (ZPD) provided by Vygotsky (1978), which emphasized the collaboration between the teacher and the student in the co-construction of knowledge.

To the best of the knowledge of the researcher, Vygotsky never used the term scaffolding. It was Bruner (1985) who used the term (scaffolding) as a label for the gradual withdrawal of adult control and support as a function of children's increasing mastery of a given task (Bronwyn 2000). Vygotsky had asserted that every child, with assistance, can do more than s/he can by himself/herself. The term scaffolding is metaphoric in nature, and has been used as an umbrella term. Critics argue that it might therefore lose some of its original meaning implied at its conception. A metaphor can also hinder the understanding of a phenomenon and can be misleading.

The metaphorical nature of the term scaffolding does not provide educators with clear and definite guidelines on how it could be used to achieve successful teaching (Verenikina 2008). Scaffolding has been interpreted and applied to educational research and practice in a variety of ways (Verenikina 2008). The relationship between scaffolding and the Zone for Proximal Development has also been interpreted and analysed in different ways. A good metaphor can help us to appreciate "as yet unanticipated connections or consequences," and yet on the other hand, a metaphor can be "misleading in finding its essential characteristics and connections" (Bronwyn 2000; Verenikina 2008:35).

Available literature generally portrays scaffolding as various forms of adult support; demonstrations; dividing a task into simpler steps; providing guidelines; keeping attention focused as well as providing examples and questioning (Bronwyn 2000; Verenikina 2008; Grabinski, Kedzior & Krasodomska 2015). A synergy of these factors might result in a deeper understanding and better utilisation of the scaffolding

metaphor. Learning in the online environments may need to consider the concept of scaffolding as explained above.

2.14 LEARNING COMMUNITIES

In order to develop a successful online course, many scholars suggest that one needs to build and sustain an online learning community (Wang & Lui 2009; Mutagh & Webster 2010). Research has shown that a learning community can enhance information exchanges, learning support, group commitment, collaboration, and learning satisfaction (Wang & Lui 2009; Mutagh & Webster 2010). Some researchers believe that the learning community is the vehicle through which learning occurs online. On the proposed framework, which is the main deliverable of this research, the Teaching and Learning Village represents this learning community. During the online courses, members depend on each other in order to achieve outcomes. The researchers claim that without support and participation of a learning community, there is no online course (Wang & Lui 2009). According to Carabajal et al (2003), there are three dimensions of an online community: a technological dimension, a task dimension, and a social dimension. The technology provides the gathering place and communication tools that make the teaching and learning transactions possible. The task dimension includes the learning content, the materials, resources, and activities used in the courses (Carabajal et al 2003; Murray et al 2012).

Online communication will consist of content, related communication and social communication such as Bulletin Boards, chat rooms, and emails. On a face-to-face (e.g. residential) school or campus, students congregate socially, therefore, the online educational environment should provide space for social interaction (Wang & Lui 2009). Research has been done on how social relationships or connectedness develops online. Usually, when a learning community is absent, students tend to receive help from family members, colleagues, or friends, and as a result build a supporting community offline. Carabajal et al (2003) and Murray et al (2012), agree that further research efforts should be made to explore the development of social interaction in e-learning communities.

Communities of practice are based on the following assumptions:

- Learning is fundamentally a social phenomenon.
- Knowledge is integrated in the life of communities that share values, beliefs, languages, and ways of doing things (communities of practice).
- The process of learning and membership in a community of practice are inseparable.
- Knowledge is inseparable from practice.
- The ability to contribute to a community creates the potential for learning.

Cognitive presence is discussed next.

2.15 COGNITIVE PRESENCE

The concept of presence in relation to cognitive presence, social presence, teaching presence, and instructor presence need to be examined. A sense of presence is a state of the mind; it is a state in which we are psychologically present in the immediate task situation (Garrison & Cleveland-Innes 2005). Generally, engagement in most tasks requires less than 100% presence psychologically when doing the tasks at home. When doing something unfamiliar like technology, there is a need to be 100% involved and 100% present. In a virtual environment, presence refers to experiencing a computer-generated environment as compared to the actual physical environment (Carabajal et al 2003).

Cognitive presence is the level and depth of critical thinking that is evidenced in interaction and communication among members in a learning community (Garrison, Anderson, & Archer 2001). Cognitive presence can provide a means to access the progression of knowledge acquisition. Garrison and Cleveland-Innes (2005) claimed that online students do not always display cognitive presence, suggesting that certain adjustments need to be made in order to produce positive learning outcomes. Cognitive presence refers to an environment and climate for deep approaches to learning and meaningful educational exchanges (Garrison et al 2001; Garrison & Cleveland-Innes 2005).

2.16 SOCIAL PRESENCE

Social presence is a perceived capacity of the medium to convey cues about facial expression, direction of looking, posture, dress, and other nonverbal cues associated with effective communication. Visual and audio stimuli are important in the presentation of presence. Most computer- mediated learning environments have few visual or audio channels available resulting in a diminished set of nonverbal cues that are important in transmitting meaning and building relationships. Social presence can be enhanced by using text-based message tools such as emoticons, providing frequent feedback, sharing personal stories and experiences, and using humour (Rudestam & Schoenholtz-Read 2010). In online learning settings that utilise new technologies, DuVall, Powell, Hodge and Ellis (2007) suggest strategies that facilitate communication and enhance social presence.

Social presence is the ability of participants within the online learning community to project their personal characteristics into the community and present themselves as real people (Garrison et al 2001). Social presence creates the community and sense of connectivity that is sometimes lacking in online classes (Garrison & Cleveland-Innes 2005). Social presence refers to the degree to which the medium is experienced as sociable, warm, sensitive, or personal; creating the impression that the person communicating is real, or the illusion that the experience is not mediated (Garrison & Cleveland-Innes 2005).

Intimacy and immediacy were defined as components of social presence. Richardson and Swan (2003) defined immediacy as the perceived psychological distance between communicators. Therefore, perceived immediacy takes place both in face-to-face and virtual environments. The literature has shown that social presence is one of the most important factors in improving instructional effectiveness and building a sense of community (Garrison & Cleveland-Innes 2005; Lowenthal 2010). The connection and feeling of being part of a learning community is significant for effective learning outcomes. A sense of community reduces isolation, and minimises student burnout, promoting interaction and cooperation among peers (Garrison et al 2001; Garrison & Cleveland Innes 2005). It is important to create an environment that increases social presence in online learning as a way to enhance interactions between the student and the instructor. One role of social presence is to function as a support for cognitive

presence. Therefore, social presence contributes towards the overall success of the educational experience (Moore et al 2010).

2.17 TEACHING PRESENCE

Teaching presence is defined as the “design, facilitation, and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes” (Anderson, Rourke, Garrison, & Archer 2001:5). Teaching presence is the responsibility of the instructor, and it facilitates the overall interaction of the learning community. According to Anderson et al (2001) and Means, Baika and Murphy (2014), the teaching presence consists of three characteristics:

- Design and administration
- Discourse facilitation and
- Direct instruction.

Teaching presence is the means to create social and cognitive presence that would bring about positive learning outcomes. Teaching presence involves designing and managing learning sequences, providing subject matter expertise and facilitating active learning. Teaching presence was said to sustain the community of inquiry, whereas social presence would build the community of inquiry by facilitating the development of trust and a sense of belonging. Instructor presence is created by the presentation of content and questions, it attempts to focus on or summarise student discussion, confirmation of understanding, diagnosis of misconceptions, injection of knowledge and response to technical concerns (Richardson & Swan 2003).Teaching presence is also associated with student satisfaction and perceived learning. Academic staff need to be trained in pedagogical skills which they require to teach online. Interaction between instructor and student are known to lead to success in the online classroom (Richardson & Swan 2003).

Figure 2.1 shows the relationship between cognitive presence, social presence and teaching presence in the form of a Venn diagram, the intersection of the three represents the educational experience.

Figure 2.1: Community of Inquiry

Adapted from Garrison et al (2000)

The concept of teaching presence evolved out of research on social presence and teacher immediacy. Mehrabian (1972) developed the concept of immediacy as non-verbal behaviours that can reduce the distance between two or more people. Later, Anderson (1979) illustrated that teacher immediacy was a predictor of teaching effectiveness.

Garrison et al (2000) differentiate social presence from teaching presence as part of the Community of Inquiry. The central focus of teaching presence is to increase social presence and student learning. Research has shown that social presence is a predictor of student satisfaction in online environments (Richardson & Swan 2003), and that it is related to student-to-student interaction and collaborative learning.

2.18 INTERACTION

Interaction has always been valued in distance education. Anderson and Garrison (1998) first discussed the three most common forms of interaction in distance education, which they claimed to be responsible for deep and meaningful learning: student-teacher, student-student, and student-content interaction. These were later expanded (Moore & Kearsley 2012) to include: teacher-teacher, teacher-content and content-content interaction. The Web provides new opportunities in the form of education in virtual laboratories and online computer-assisted learning (Payne & Reinhart 2008), and as educators, we need to understand these different formats.

Student-instructor interaction refers to the interaction between the student and the instructor. This can take the form of the instructor delivering information and encouraging the student by providing feedback (Sher 2009). The student can also interact with the instructor by asking questions or communicating with the instructor regarding course activities. Student-student interaction is the exchange of information and ideas that take place among students. This can be during the presence or absence of the instructor. Student-student interaction can foster learning through student collaboration and knowledge sharing (Sher 2009). Therefore, student-student interaction is a two-way reciprocal communication between or among students who exchange information, knowledge, thoughts, or ideas regarding course content. *Student-content* interaction is the method by which students obtain information from the course materials. The content can either be in the form of text, audio, videotape, CD-ROM, computer software, or online communication. Student-content interaction is therefore a process of individual students elaborating and reflecting on the subject matter or the course content (Sher 2009; Moore et al (2010).

2.19 SUMMARY

This literature review discussed the theoretical and contextual foundations on which this research is based. The chapter explores several topics that are significant to this study. One such topic is Open Distance Learning (ODL). Today's ODL may be defined as education in which the student and instructor while physically separated are intellectually connected via technology. The increasing popularity of the Internet has seen a steady growth in distance education especially in the developed world.

Distance learning is being transformed into Open Distance and electronic Learning (ODeL) because of its e-learning component.

The focus of the study is about e-learning, especially how the students and their instructors experience, perceive and evaluate e-learning. Thus, the terms e-learning, online learning and web-based learning are sometimes used synonymously. An important feature is that these terms all refer to a form of instruction that is mediated by technology.

An examination of some literary sources reveals that accounting education started incorporating computers after the invention of the personal computer. There are clear indications that Management Accounting education could embrace these emerging technologies into new pedagogical models. Today's Management Accounting student needs to be exposed to the technology early since the working environment will be technology-enabled.

It is further suggested that in order to acquire and construct new knowledge, there is need to understand how students learn (Refer to the framework in Figure 4.1). The framework also suggests that instructors should include using spreadsheets during their Management Accounting courses and the teaching and learning village on the framework can be the equivalent to the Community of Inquiry. The framework is thus an instrument, which might make a contribution of organising, managing or implementing e-learning programmes.

In the next chapter, the methods employed to conduct this research are discussed.

CHAPTER THREE: METHODOLOGY

3.1 INTRODUCTION

In the previous chapter, the literature review established some theoretical and contextual foundations on which this research is based. The current chapter outlines the methodology used in this study as well as the rationale in choosing a mixed-methods approach, the design of an online quantitative survey and the unstructured interview questions.

The purpose of this research is to explore and investigate ways of how e-learning can be deployed to enhance the learning and teaching of Management Accounting at Unisa. The study relied on the mixed methods research design because this enables the researcher to study complex phenomena within their context. In this study, the researcher seeks to develop a detailed understanding of the processes of how students and instructors experience and evaluate online learning in Management Accounting using the *my*Unisa e-learning platform. The detailed understanding of the phenomena is hoped to provide useful information that can further inform researchers and educational practitioners.

The layout of the chapter is as follows: Section 3.2 introduces the Research Onion. Section 3.3 discusses the philosophical stances while Section 3.4 portrays the approaches. Section 3.5 discusses the strategies, whereas Section 3.6 explores the choices that the researcher has. Section 3.7 gives the time horizon of the research while Section 3.8 discusses the techniques and the procedures of the research. Section 3.9 discusses the population of the study. Section 3.10 introduces sampling and sample sizes while Section 3.11 discusses random samples. Section 3.12 discusses judgemental sampling and Section 3.13 sample size table. Section 3.14 discusses technological glitches. Data collection and analysis is covered in Section 3.15. Section 3.16 discusses the validity of the study and Section 3.17 covers the reliability of the study. Section 3.18 is about ethical considerations. Section 3.19 gives a summary of the chapter.

The next section introduces the research onion, which is used to guide the discussion of the methods employed in this research. Figure 3.1 illustrates the research onion.

3.2 THE RESEARCH ONION

The suggested research onion has six layers, with each layer having one or more further items that the researcher would be required to choose from. The layers are indicated in order from the outside as: the philosophical orientation of the researcher; the research approaches adopted; appropriate research strategies; the research time lines under consideration; and the data collection and analysis techniques employed by the researcher (Saunders, Lewis & Thornhill 2012).

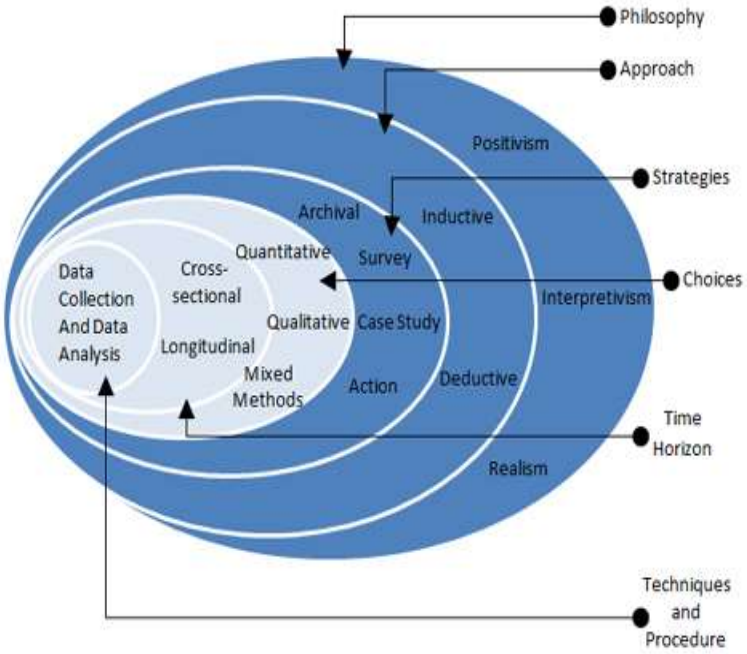

Figure 3.1: The research onion

Source: *Saunders et al (2012)*

3.3 PHILOSOPHICAL STANCES

Layer one of the research onion contains the philosophical stances associated with the philosophies. Each choice at this level requires careful thought since they provide structure and guidance, and possible limitations to subsequent decisions and ultimately how the researcher can collect and analyse data to create valid findings (Sapford 2007). The researcher adopted the constructivism philosophical stance at this level. The other philosophies like interpretivism, pragmatism or positivism may be used whenever applicable.

Objectivism recognises that social phenomenon and their meanings exist separately to social actors. Constructivism argues the opposite to objectivism. It believes that social phenomena are actually by social actors. Constructivism is one of the theories discussed at length in the framework. It is also the ontological worldview of choice on the philosophical stances. Creswell (2014) discusses constructivism extensively, and how it might contribute towards knowledge construction in general. The two main reasons for this choice are, firstly, constructivism is the preferred theoretical approach when it comes to new areas of study like e-learning. Moreover, when using the qualitative approach, constructivism is better suited as a theoretical approach (Creswell 2014). This research uses qualitative analysis for the unstructured interviews held with lecturers.

Positivism generates hypotheses or research questions that can be tested. Any explanation can be measured against knowledge of the worldviews. Emphasis is on quantitative results that lend themselves to statistical analysis (Neuman 2011; Babbie 2013). Realism is similar to positivism in its processes and belief that social reality and the researcher are independent of each other. Interpretivism refers to approaches emphasising the meaningful nature of people's participation in social and cultural life (Mouton 2001; Neuman 2011). Researchers analyse the meanings people confer upon their own and others actions and hope to understand the changes and meanings attached by these people. Pragmatism argues that both constructivism and objectivism are valid ways to approach research. Pragmatism allows the researcher to view the topic from either or both points of view, which creates a practical approach to research. Therefore, there are times when there are interactions of these philosophies.

3.4 APPROACHES

A pilot study had been carried out during the design of the interview questions and the online questionnaire. The questions were pilot-tested on Unisa students and tutors doing Management Accounting (MAC2601) at a Unisa satellite campus. The researcher incorporated the suggestions and recommendations of the students and tutors before taking his draft questions to the supervisors for further scrutiny. The supervisors gave their input and suggestions both for the interview questions and the questionnaire. The online questionnaire was further taken to a statistician who also

gave his professional views. Once in final format, the supervisors gave the researcher permission to carry out the interviews and administer the online survey.

In layer two, the researcher used both the deductive and the inductive approaches when there was a need. A survey strategy is associated with a deductive approach. Survey research is the collection of data obtained by asking questions in person, on paper, by phone or online. The researcher sent an online questionnaire in order to collect data from the respondents. Conducting the survey is one form of primary research that is obtaining data from source. When the same data is accessed by other interested parties later, it will be a form of secondary research. Common types of survey include interviews and questionnaires usually comprised of multiple choice questionnaires, opinion or pols. Questionnaires were to be distributed through mail surveys while interviews would be held in person or over the phone. A survey offers the researcher an economical way of collecting large amounts of data which can address the what, who, whom, where, when and how of any given topic (Sapford 2007). Deduction goes in the opposite direction to that of induction. A deductive method is an approach where conclusions are drawn from general laws, theories or hypotheses in quantitative analysis. Induction, on the other hand, is a method by which one attempts to arrive at a theory or general knowledge by summarising observations of occasional incidents or phenomena (Creswell, 2014) as in qualitative analysis. Onwuegbuzie, Bustamante and Nelson (2010) state that mixed methods research includes the use of induction, which refers to the discovery of patterns, deduction, which involves testing theories and hypotheses, and abduction, which refers to uncovering and relying on the best set of explanations for understanding the results. Therefore, the researcher used the inductive approach to analyse the interviews and the deductive approach to analyse the survey instrument.

3.5 STRATEGIES

Case study design involves one or more individuals or cases in the real context. The number of cases need to be restricted in order to draw clear conclusions about the cases. The data to be collected may include interviews with participants or watching aspects of their behaviour.

The online survey used a questionnaire with thirty-seven (37) Likert type statements. A questionnaire is a form containing a set of questions, especially addressed to a

statistically significant number of subjects and is a way of gathering information for a survey. The Oxford living dictionary (2018) defines a questionnaire as a written or printed list of questions to be answered by a number of people, especially in a particular survey. This instrument was emailed to all the participants in the sample and later to all the participants in the population. Repeat e-mails were also done (twice) reminding participants of the invitation.

3.6 CHOICES

Mixed-method is when the researcher uses qualitative and quantitative methods in the process of the study, data collection and data analysis. This is the method the researcher used and it has clear benefits as highlighted by Bergman (2008). Mixed method research evolved in response to the observed limitations of both quantitative and qualitative designs and is a more complex approach (Caruth 2013). Mixed methods research offers richer insights into the phenomenon being studied and allows for the capture of information that might be missed by using only one research design. It also enhances the body of knowledge and more questions of interest for future research. It can furthermore handle a wider range of research questions as it is not limited to one research design (Onwuegbuzie & Leech 2010).

Quantitative researchers have often claimed that qualitative research is hard to generalise, interpret, and duplicate. Meanwhile, qualitative researchers have claimed that quantitative researchers utilised immaterial hypotheses and shallow descriptions (Caruth 2013). The goal of quantitative research is to propose a hypothesis to be either accepted or rejected, while the goal of qualitative research is to produce a hypothesis (Caruth 2013). Therefore, the mixed method approach has certain strengths and weaknesses as explained in the next sections.

This research adopted a mixed-method approach. Onwuegbuzie and Leech (2010) define mixed method as a method that includes both qualitative and quantitative data collection and analysis in parallel. It is a type of research in which a researcher uses the qualitative research paradigm for one phase of the study and a quantitative research paradigm for another phase. Onwuegbuzie and Leech (2010) claim that mixed-method is a natural complement to using either the qualitative or quantitative research methods in isolation. Therefore, mixed method is a type of research where

the researcher mixes qualitative and quantitative research techniques, methods, approaches, concepts or languages in a single study.

Onwuegbuzie et al (2010) state that mixed method includes the use of induction, which refers to the discovery of patterns, deduction which involves testing theories and hypotheses, and abduction which refers to uncovering and relying on the best set of explanations for understanding the result. Onwuegbuzie and Leech (2010) identified the following rationales for mixing qualitative and quantitative approaches: participant enrichment, instrument fidelity, treatment of integrity and significance enhancement. Participant enrichment entailed that the number of participants were increased from 1,176 to 5,884 by the researcher, because Onwuegbuzie and Leech (2010) argue that the larger the sample, the more reliable and valid the research findings will be. The researcher had to increase the sample size to obtain more responses. If the researcher had obtained a satisfactory response rate, he would not have increased the sample size.

According to van der Merwe (1996), quantitative research uses methods from the natural sciences that are designed to ensure objectivity, generalisability and reliability. Denzin and Lincoln (2012) define qualitative research as a situated activity, which locates the observer in the world. It involves an interpretive, naturalistic approach to the worldview. Denzin and Lincoln (2012) argue that human learning is best researched by using qualitative data. The central phenomenon in this study is about how students experience and evaluate online learning. One question, which may have to be answered is: Which research methodology might satisfactorily address how to investigate the way in which distance students experience and evaluate online learning? Guba (1990) suggests selecting a research methodology that supports the paradigm whose assumptions are best met by the phenomena being investigated.

This study is about e-learning, and seeks to understand how distance students experience and evaluate this mode of learning. The qualitative approach will be suitable for part of this exploration. Qualitative approaches are becoming more widely used as methods improve and researchers look for better ways of gathering data about a problem (Denzin & Lincoln, 2012). The qualitative approach will be used to analyse the interview questions and other open-ended questions on the online survey, while the online survey will be analysed quantitatively using statistical techniques.

The basic sets of beliefs that guide an action are sometimes called paradigms, epistemologies or ontologies or broadly conceived research methodologies (Babbie 2013; Neuman 2011; Creswell 2014). Denzin and Lincoln (2012) suggest that a paradigm consists of ontology, epistemology, methodology, and, methods. The highest level of complexity in research is referred to as the methodological paradigm. This includes qualitative and quantitative paradigms (Mouton 2001; Neuman 2011). Qualitative research is described as a paradigm that allows the research to obtain an insider perspective on social action (Babbie 2013). Qualitative data is usually rich and informative. A qualitative approach is more likely to uncover the subjective experiences of participants, discover their perceptions, and is more likely to focus on the meanings that individuals attribute to their experiences (Denzin & Lincoln 2012). Each paradigm makes its own assumptions about the nature of reality (Babbie 2013). Issues of research methods are secondary to questions of paradigm in that the paradigm which is the world view, guides the investigator in the choice of methods (Creswell 2014). These are some of the reasons the researcher included the interviews in combination with the online survey.

In quantitative research, the researcher decides what to study and asks specific questions; collects quantifiable data from participants; analyses the numbers using statistics, and conducts the inquiry in an unbiased objective manner (Creswell 2014). On the other hand, in qualitative research, the researcher relies on the views of participants; asks broad, open-ended and general questions; collects data consisting mostly of words and statements from participants (or shows them pictures or diagrams); describes and analyses these words for themes; and conducts the inquiry in a subjective, biased manner (Creswell 2014). Quantitative research is “Explaining phenomena by collecting numerical data that are analysed using mathematically based methods” (Denzin & Lincoln 2012:21). In research, the objective is always to explain something, usually phenomena.

Quantitative research methods are used when a research question is demanding a quantitative answer. Generally, quantitative research methods can cover breadth but usually not depth. Research is deemed good if it provides rich evidence and offers credible and justifiable accounts, if it can be utilised by someone in another situation, and if the research process and findings can be replicated (Cohen, Manion, & Morrison 2007). However, quantitative studies appear to lack the sensitivity to aid understanding

of the nature, quality or processes engaged within an experience (Denzin & Lincoln 2012). These limitations led to the choice of a mixed method research design in this thesis.

Figure 3.2 aims to capture the interrelationship of the philosophical stances, methodologies and design approaches of research problems.

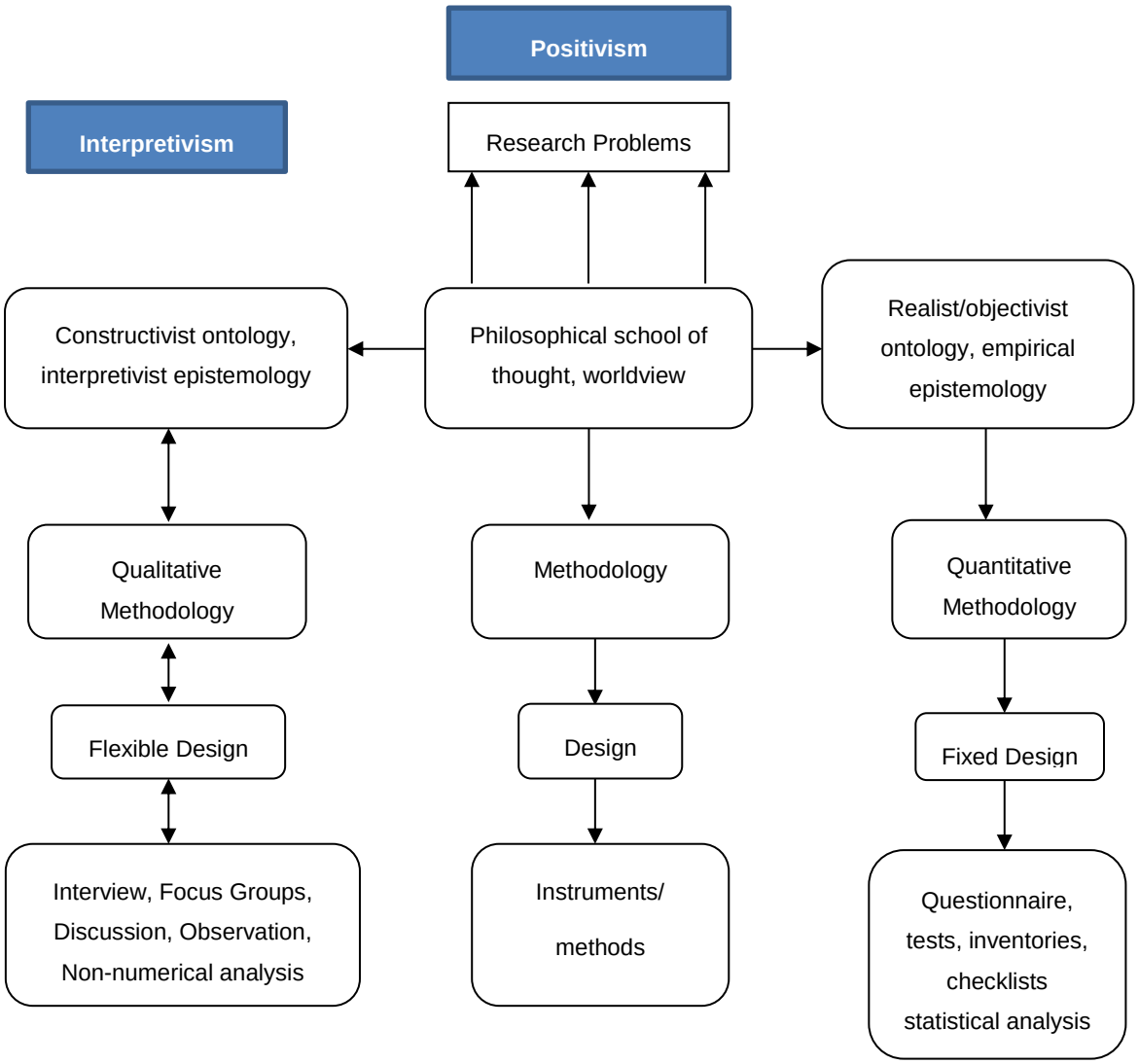

Figure 3.2: Foundations of research

Source: *Tuli, 2010*

Figure 3.2 compares closely-related methodological issues pertaining to qualitative and quantitative research. Any weakness in the qualitative methodology ought to be complemented by strengths in the quantitative methodology. The figure illustrates the differences among ontological, epistemological, and methodological perspectives.

Each research methodology has its own relative strengths and weaknesses (Tuli 2010). The selection of a research methodology depends on the paradigm and beliefs about the nature of that reality and humanity (ontology), and the theory of knowledge that informs the research (epistemology), and how that knowledge may be gained (methodology) (Tuli 2010).

3.7 TIME HORIZON

Cross-sectional designs can use quantitative and qualitative research as they measure an aspect or behaviour of the many groups or individuals at a single point in time. The time-horizon for the study was cross-sectional. Longitudinal design can use qualitative and quantitative research, but they study events and behaviours using concentrated samples over a longer period (Field 2009). This research was limited to the original timeframe and any slippages in terms of time-horizons were coincidental and not intended. While this study was cross-sectional in nature, the researcher believes that a longitudinal research could be useful to establish how students experience and evaluate online learning over a number of years, say from first year to third year, as suggested by Schneider and Stern (2010).

3.8 TECHNIQUES AND PROCEDURES

The last (innermost) layer of the research onion moves the research design into the practicalities of data collection and analysis. The researcher is best suited to decide on the methods to employ in order to answer the research questions. The layer includes decisions on the sample groups, questionnaire content, and questions to be asked in interviews. The decisions and tools employed at this final stage must comply with the philosophies, philosophical stances, strategies, choices and time-horizons already stipulated if results are to be created (Brace 2008). Questionnaires, mostly about the *my*Unisa platform, were used as research instruments of this study. The literature review was used to construct questionnaires for the online survey. More detail about how data was collected including some challenges is covered in Section 3.14 – Technological Glitches.

Research design is a plan for collecting and analysing evidence that will make it possible for the researcher to answer questions that may be posed. The design of an investigation includes all aspects of the research, from data collection details to the

selection of the techniques of data analysis (Neuman 2011; Babbie 2013; Creswell 2014). Qualitative and quantitative research differs in some ways and yet they can complement each other. Qualitative research relies on soft data such as impressions, words, sentences, symbols, diagrams, photos, etc. and, and it gathers rich data while quantitative research relies on specific data in the form of numbers. The two approaches use different research strategies. Qualitative data involves documenting real events, recording what people say, their words, gestures, tone, observing specific behaviours, studying written documents, or examining visual images (Mouton 2001; Neuman 2011).

The following is a description of the methodology that the researcher utilised in order to collect the relevant data. The researcher designed twenty-four unstructured interview questions; these were directed at the lecturers and were processed qualitatively. The researcher also designed a quantitative instrument mostly around the *my*Unisa platform and was processed quantitatively. These two appear in Appendix A and B respectively. The methodology, therefore, became a mixed method approach. The mixed method approach is superior to a mono method that is either a quantitative or a qualitative method, because it combines both quantitative and qualitative perspectives.

The researcher, supervisors and the Unisa statistician met on several occasions in order to agree on the structure and strategies to be followed when implementing the online survey. The recommendations by the statistician and supervisors were followed; these included the structure of the instruments, the total number of items and their possible effects to validity and reliability.

For the purpose of this study, the questionnaire (Appendix A) formed the primary data collection method, and its content was guided by the literature reviewed and recommendations from the statistician. The advice from the statistician was helpful with regard to obtaining validity and reliability of the items for statistical purposes. The statistician recommended thirty-seven items in the instrument based on the anticipated sample size. The questionnaire was administered initially to 1,176 participants, and later increased to the total population of 5,884 because of a poor response rate.

3.9 POPULATION OF THE STUDY

In order to define a population, the researcher specifies the unit being sampled, the geographical location, and the temporal boundaries of the population (Mouton 2001; Neuman 2011). Any characteristic of a population is called a population parameter. A population can be in two categories namely: the target and the accessible populations. The target population is the actual population that the researcher would ideally like to generalise. However, this population is rarely available. Therefore, the population that the researcher is able to generalise is the accessible population. In other words, a population is the theoretical specified aggregation of the elements in a study (Babbie 2013). This population refers to the complete set of elements and their characteristics about which a conclusion is to be drawn, based on a sample. This population includes all individuals whom the researcher is interested in obtaining information from, and making inferences. In this study, the population studied included all second year Management Accounting students registered at Unisa in 2015. This amounted to 5,884 students.

3.10 SAMPLING AND SAMPLE SIZE

While it is not necessary to collect data from every individual in the population in order to get valid findings, it would naturally enhance the reliability of the study. In qualitative and quantitative research, only a sample of a population is selected for any given study. A sample is a smaller set of cases that a researcher selects from a larger pool (population), and may generalise results to the whole population (Babbie 2013; Neuman 2011). A researcher needs to choose a sample because this would be more affordable in terms of time and costs. A good sample needs to be representative and it needs to deepen an understanding about the population at large. Representative samples are based on theories of probability from mathematics. The ratio of the size of the sample to the size of the target population is the sampling ratio. Generally, a representative sample can give more accurate predictions about a specific sample.

There are two ways of choosing a sample, namely:

- Probability (random) sampling which ensures that the probability of each case being selected from the population is known and is usually equal for all cases (Babbie 2013).

- Non-probability (non-random) sampling is a sampling technique where the samples are gathered in a process that does not give all the individuals in the population equal chances of being selected (Babbie 2013).

The major difference between the two methods is that probability sampling allows the reliability of the sample results in approximately the population statistics under study. In non-random sampling, this assessment of reliability is not possible regardless of how careful the researcher is in selecting elements of the sample. Naturally, in non-random sampling, there is no guarantee that the samples represent the populations being studied (Leedy 2010). The researcher should, however, strive to ensure the sample is representative of the population under study, and that the outcome of the research can be relied upon.

3.11 RANDOM SAMPLES

Probability theory in applied mathematics relies on random processes (Mouton 2001; Neuman 2011). In a random process, each element has an equal probability of being selected. A simple random sample represents a sample design in which selections are drawn from a population in a way that gives every member and every combination of members an equal chance of being selected (Creswell 2014). Arguably the simplest way to select a simple random sample is to assign every member of the population a number and use a random number generator (captured as a table) to select the sample.

Simple random samples are important because randomness eliminates bias in research surveys. Moreover, many results in statistics are derived from probability theory. The use of probability assumes that random processes are at work. For statistical results to be valid, samples that can be treated as random variables should be chosen. However, some disadvantages are that, simple random samples can be very difficult to obtain in practice. Sometimes the mechanism for guaranteeing a truly random selection requires some ingenuity (Creswell 2014). Generally, human subjects make matters worse as they can simply refuse to participate in a statistical sample. The researcher experienced some of this resistance from prospective participants in this study as highlighted earlier.

Systematic sampling is simple random sampling which employs a shortcut for random selection. In systematic sampling, you choose every nth individual in the population until you reach your desired sample size (Creswell 2014). He further states that the researcher calculates a sampling interval by skipping elements in the frame before selecting one for the sample. This procedure is not as precise and rigorous as using the random numbers table, but it is convenient because individuals do not have to be numbered. In this study, the sample was initially chosen by selecting every fifth student number until 1,176 participants of the online survey were chosen.

Systematic sampling was employed in this study, since it has many advantages (Creswell 2014):

- It is simple to implement.
- It may be started without a complete listing frame.
- It provides for a better random distribution than simple random sampling.
- The variance may be smaller than for simple random sampling.

3.12 JUDGEMENTAL SAMPLING

Judgemental sampling is used when a sample is taken based on certain judgements about the overall population. It is sometimes called purposive sampling. Purposive sampling groups participants according to preselected criteria relevant to a particular research question. Our central research question is: How do Unisa students experience and evaluate online learning in Management Accounting? Purposive sampling can be used by a researcher to select unique cases that are especially informative. A researcher may also use purposive sampling to select members of a hard-to-reach, specialised population. Purposive sampling can be used when a researcher wants to identify particular types of cases for in-depth investigation (Neuman 2011).

This method is often used in exploratory studies like pre-testing (piloting) of questionnaires and focus groups. Purposive sample sizes are often determined based on theoretical saturation. There is, therefore, a need to do data review and analysis in conjunction with data collection during purposive sampling. An advantage of purposive sampling is the reduced cost and time involved in acquiring a sample (Neuman 2011). The lecturers are a special group that were selected purposively.

3.13 SAMPLE SIZE TABLE

The population for this research was all the second year Management Accounting students registered at Unisa in the academic year 2015. There were 5,884 registered second year Management Accounting students in 2015.

Various formulas can be applied to calculate a required sample size (Research Advisor 2006). One such formula is:

$$\frac{n = X^2 * N * P\ (1-P)}{ME^2 * (N-1) + (X^2 * P * (1-P)}$$

Where:

$$n = sample\ size$$

X^2 = Chi Square

$$N = Population\ size$$

$$P = population\ proportion$$

$$ME = designed\ Margin\ of Error$$

An alternative is to use a table. The Research Advisor (2006) have come up with a sample size table (See Table 3.1); this table gives the required sample size for a given population. The confidence levels are 95% and 99% respectively. Using this table, a population size of 5,000 would have a sample size of 1,176 at a 95% confidence level with a 2.5% margin of error. There is an inverse relationship between sample size and the margin of error; for instance, smaller sample sizes will yield larger margins of error and vice versa. The researcher's population of 5,884 students fell within this range, hence, the researcher chose a large sample size of 1,176 - 5,884 divided by 1,176 = 5 (approximately).

Table 3.1: Required sample size

Required Sample Size†

Population Size	Confidence = 95% Margin of Error				Confidence = 99% Margin of Error			
	5.0%	3.5%	2.5%	1.0%	5.0%	3.5%	2.5%	1.0%
10	10	10	10	10	10	10	10	10
20	19	20	20	20	19	20	20	20
30	28	29	29	30	29	29	30	30
50	44	47	48	50	47	48	49	50
75	63	69	72	74	67	71	73	75
100	80	89	94	99	87	93	96	99
150	108	126	137	148	122	135	142	149
200	132	160	177	196	154	174	186	198
250	152	190	215	244	182	211	229	246
300	169	217	251	291	207	246	270	295
400	196	265	318	384	250	309	348	391
500	217	306	377	475	285	365	421	485
600	234	340	432	565	315	416	490	579
700	248	370	481	653	341	462	554	672
800	260	396	526	739	363	503	615	763
1,000	278	440	606	906	399	575	727	943
1,200	291	474	674	1067	427	636	827	1119
1,500	306	515	759	1297	460	712	959	1376
2,000	322	563	869	1655	498	808	1141	1785
2,500	333	597	952	1984	524	879	1288	2173
3,500	346	641	1068	2565	558	977	1510	2890
5,000	357	678	1176	3288	586	1066	1734	3842
7,500	365	710	1275	4211	610	1147	1960	5165
10,000	370	727	1332	4899	622	1193	2098	6239
25,000	378	760	1448	6939	646	1285	2399	9972
50,000	381	772	1491	8056	655	1318	2520	12455
75,000	382	776	1506	8514	658	1330	2563	13583
100,000	383	778	1513	8762	659	1336	2585	14227
250,000	384	782	1527	9248	662	1347	2626	15555
500,000	384	783	1532	9423	663	1350	2640	16055
1,000,000	384	783	1534	9512	663	1352	2647	16317
2,500,000	384	784	1536	9567	663	1353	2651	16478
10,000,000	384	784	1536	9594	663	1354	2653	16560
100,000,000	384	784	1537	9603	663	1354	2654	16584
300,000,000	384	784	1537	9603	663	1354	2654	16586

Table 3.1 is available to researchers in order to choose a few standard sample sizes, e.g. (n = 1,176; P = 5,000 at 95% Confidence level). This table was compiled by Research Advisor (2006) and has thirty-five different sample sizes.

In order to choose a sample of 1,176 students from a population of 5,884 students, it meant the researcher had to choose every fifth student. First, the 5,884 students were sorted according to student number, from smallest to largest. The following Excel™ formula was used to select every fifth record: "= MOD (ROW (A1) -1. 5) = 0" where "A1" is a reference for the cell that contains the first data item. This Excel formula filters

every fifth student number by selecting the student in every fifth row. The full Excel procedure was as follows:

- Click on an empty cell in the first row that contains data, to the right of the existing columns on the excel spreadsheet.
- Copy and paste the following formula into the Formula field above the spreadsheet: = MOD (ROW (A1)-1, 5) = 0. If needed, replace “A1” with the reference of the cell that contains the first data item. If you want to filter another number of rows, replace “5” with an alternate number.
- Select the cell that contains the formula and drag its lower right corner downward to the bottom of the spreadsheet, so that the formula is applied to every data row.
- Open the “Data” tab and click on the cell into which you first pasted the formula. Click the “Filter” icon in the Ribbon.
- Click on the drop-down menu arrow that appears in the formula cell to open it. Deselect the “Select all” check box and click on the one next to “True”
- Click on “Ok” to make Excel display only the fifth items in the spreadsheet, starting with the first record.

The above is how the researcher selected the 1,176 student records before printing them. The printout comprised twenty-five pages with each A4 page containing forty-seven records.

An online survey developed by the researcher was emailed to the participating students (n = 1,176). Each survey contained 37 items where each item used a 5-point Likert scale (1 = Strongly disagree, 2 = Disagree, 3 = Neither disagree nor agree, 4 = Agree, 5 = Strongly agree). Each survey functioned as an e-learning skills inventory. Areas covered in the survey were on how students interacted with the *my*Unisa LMS with regard to the following: level of knowledge about e-learning; prior exposure using e-learning; access to e-learning and other resources; and general level of knowledge usage. The surveys also had three open-ended questions, which required narrative responses. The narrative responses would be triangulated with the interview responses as part of the data analysis.

3.14 TECHNOLOGICAL GLITCHES

The providers of the online instrument Survey Face (Surveyface.com is available at https://Surveyface.com/) had to upgrade their application in August 2015. The researcher's questionnaire had already been created on the survey site prior to the upgrade and no problems had been experienced. After the upgrade, the researcher experienced great difficulty in accessing the survey site, especially when using a laptop. A possible explanation for the challenge was the Windows Vista Operating System and Internet Explorer Version 7 web browser that the researcher was using on the laptop. These were no longer compatible with the upgraded application. As a result, the researcher could not sign into the survey site for some time. The researcher contacted the survey-site support team, who confirmed that the type of operating system and web browser would affect the ability to access the survey site.

Meanwhile, the researcher had brought these challenges to the attention of the supervisors, who in turn created a link to the survey site. The researcher used this link to invite the 1,176 students to participate in the survey. Each invitation would have a covering letter, which detailed the ethical considerations and the fact that each participant was free to withdraw at any time without giving any reasons.

The researcher used the blind copy facility in emailing the respondents, to conform to anonymity and confidentiality requirements. Potential participants were assured that their information would be held in strict confidence and that survey responses would be anonymous. Ethical clearance was obtained at the academic institution prior to data collection. A letter of approval from Unisa Research permission sub-committee is attached as Appendix D. When a blind copy is used, the recipient will not be able to see the other recipients (where there are multiple recipients), but will have the impression that they are the only recipient of the email.

After submitting about three hundred invitations, the researcher received a warning from the email provider (Yahoo) that he could be blocked for both incoming and outgoing mail, and that any mail that could not be delivered within 48 hours would be deleted. This message was unsettling in the sense that the researcher did not know whether any invitations would be deleted before being read by their intended recipients or whether incoming and outgoing mail would be blocked as per warning.

This was not the last technological obstacle – the "*my*life" email facility at Unisa was down at about the same time (August). This probably explained the warning from Yahoo; there was possible congestion in cyberspace because the "*my*life" emails were not being delivered. The researcher cannot quantify the proportion of the sample that could have been affected by this downtime. The "*my*life" email facility was operational during the last week of September.

Responses started trickling in very slowly. Though this is not a technological issue, it still remained an issue. This was also Unisa's examination time. Some students do take study leave in order to prepare for the examinations. This was affirmed by the automatic email responses to the invitations that the researcher received. The researcher purchased a new laptop that had a compliant operating system and a compliant web browser in an effort to remedy some of the challenges. These technological problems delayed the distribution of the questionnaire to the participants, while the slow response rate impacted the research progress.

3.15 DATA COLLECTION AND ANALYSIS

The study sample was made up of 1,176 students registered for the Management Accounting course at Unisa in 2015 (the section on sample size gives details of how the sample was chosen). This is an example of a random sample. Six lecturers of the same course were contacted for interviews. However, the researcher only managed to interview four lecturers, as he could not contact one lecturer, and the other lecturer indicated that he was too busy to attend to interviews. Purposive sampling was employed to select the participants for the interviews. A researcher to select unique cases that are especially informative can use purposive sampling. A researcher may also use purposive sampling to select members of a difficult-to-reach specialised population as has been highlighted before. Also, purposive sampling can be used when a researcher wants to identify particular types of cases for in-depth investigation (Neuman 2011).

In this study, the cases of interest are the students studying Management Accounting at a distance (online), as well as their lecturers. An advantage of purposive sampling is the reduced cost and time involved in acquiring a sample. Open-ended questions and interviews were used to collect rich data from the participants, by giving them an opportunity to describe their experiences fully. Probing questions were used to

encourage in-depth descriptions of the responses. Collecting data from multiple sources is known as triangulation, and it provided breadth and depth to the study, which further ensured complete and thorough findings as well as impacting on reliability and validity of the study. A phenomenological analysis does not explain or discover causes, but clarifies meanings of phenomena from lived experiences (Penner & McClement 2008). An understanding of phenomenological approaches may contribute towards improved online experiences or result in valuable knowledge about individual experiences.

If a researcher cannot clearly identify the phenomenon at play, a phenomenological approach is most likely not the appropriate design (Neuman 2011). The experiences were grouped into themes or according to analysis headings so that relationships between different themes and factors could be identified. The findings were arranged according to themes and topics, and they highlighted the key issues being discussed. The phenomenological approaches are good at surfacing deep issues and in making voices heard, according to Lestor (2010). The voices of both the lecturers and the students were crucial at this stage, because e-learning platforms are playing a significant part in the educational process. The online survey was processed quantitatively. The next section discusses the validity of the study.

3.16 VALIDITY OF THE STUDY

Researchers need to check for the accuracy and credibility of their findings. Reliability and validity are central issues to measurement as they help establish the truthfulness, credibility, and believability of the findings. Each of them is important and they are related to each other (Field 2009).

Validity indicates the degree to which an instrument measures what it is supposed or intended to measure (Opperheim 2005). There are several types of validity, but for this research, construct validity will be used.

Construct validity, shows how well the test links up with a set of theoretical assumptions about an abstract construct such as intelligence, ICT literacy or Frequency of use. The concepts used to express validity and reliability are broader than those associated with qualitative research. McMillan and Schumacher (2001) state that validity is the degree to which the interpretations and concepts have mutual meanings between the participants and the researcher. The online questionnaire was

reviewed by the statistician in order to ensure the validity and reliability of the constructs.

3.17 RELIABILITY OF THE STUDY

Reliability is a pre-condition for validity. Reliability means dependability or consistency of measurement. The opposite is a measurement process that yields erratic, unstable, or inconsistent results (Field 2009). Reliability includes both the characteristics of the instrument as well as the condition under which it is administered – both should be consistent. Naturally, reliability is never perfect, but is always a matter of degree. The error component produces the inconsistencies and unreliability which needs to be minimised, while reliability is the degree to which the findings of the research are independent of accidental circulation (Silverman 1997). Silverman (1997) also defines reliability as the extent to which the results are consistent over time, and are an accurate representation of the total population under study. If the results can be reproduced with a similar methodology, then the instrument is considered to be reliable. The researcher increased the sample size from n = 1,176 to n = 5,884 in an effort to improve the reliability and validity of the quantitative sample, after computing a more realistic response rate.

Therefore, reliability measures the extent to which data collection techniques or analysis procedures yield consistent and dependable results (Field 2009). That means, if the same scale is used to measure a construct several times, one should expect to get the same results each time (Field 2009). The Cronbach's Alpha is the most common measure of reliability. It is calculated by splitting data into two equal portions and calculating the correlation coefficient of each half. The research used construct reliability for internal consistency using Cronbach's Alpha. Values between 0.6 and 0.8 for Cronbach's Alpha are deemed acceptable while values above 0.8 indicate good reliability. Values below 0.6 are not acceptable. Some authors suggest a cut-off point of 0.7 in place of 0.6. However, the value of Cronbach's Alpha tends to increase as the number of items in the scale increases (Field 2009). Thus, it is possible to obtain a high alpha value that may not be linked to high reliability of the scale. Therefore, caution is required when using this reliability scale. The researcher decided to accept values within the stipulated ranges, unless there were special circumstances for not complying.

The reliability of the constructs as measured by Cronbach's Alpha are summarised in Table 3.2.

Table 3.2: Reliability of the constructs

Construct	Cronbach Alpha
ICT Literacy	0.6094
Facilitate knowledge acquisition	0.7279
Usability of *my*Unisa	0.8993
Administrative functions	0.7592
Frequency of use	0.8146

All these measures are acceptable for construct reliability.

3.18 ETHICAL CONSIDERATIONS

Research with people raises issues related to ethical considerations. Unisa requires any research involving the University, its employees or its students to obtain ethical clearance prior to conducting the study, and to comply with these stipulations throughout the research process. This is consistent with what scholars and researchers prescribe. Creswell (2014) states that a researcher has an obligation to respect the rights, needs, values, and desires of informants. While Miles et al (2014) cautions researchers to be aware of these issues before, during and after the research has been conducted. Some of these issues include the following:

- Informed consent (Do participants have full knowledge of what is involved?)
- Harm and risk (Can the study hurt participants?)
- Honesty and trust (Is the researcher being truthful in presenting data?)
- Privacy, confidentiality, and anonymity (Will the study intrude too much into group behaviours?)
- Intervention and advocacy (What should researchers do if participants display harmful or illegal behaviour?)

The researcher took the necessary steps in order to adhere to the strict ethical guidelines that were intended to uphold participants' privacy, confidentiality, dignity,

rights, and anonymity. The steps taken by the researcher after obtaining ethical approval are described in the following sections:

3.18.1 Informed consent

The researcher informed the participants (lecturers and students) of the purpose of the study, their role, the data collection methods, and the extent of the research, before the actual research was conducted. The online questionnaire had a section where the respondents ticked to register their consent to participate.

3.18.2 Voluntarism

Participants were informed that their participation was voluntary, and that they were free to withdraw at any time without giving a reason.

3.18.3 Harm and risk

The researcher assured participants that no one was going to suffer any harm whether physical or psychological, because of their participation.

3.18.4 Honesty and trust

The ethical guidelines required absolute honesty and trustworthiness during data collection and analysis.

3.18.5 Privacy, confidentiality, anonymity

The researcher assured participants that all information would be confidential; that the identity of the participants would not be revealed to anyone, and that the findings would be anonymously processed.

Research with human participants requires ethical approval for the following reasons (Canterbury Christ Church University 2006), to:

- Protect the rights and welfare of participants and to minimise the risk of physical and mental discomfort.
- Protect the rights of the researcher in carrying out any legitimate investigation as well as to protect the reputation of the University for any research conducted.

- Minimise the possibility of claims of negligence against individual researchers, the University and any collaborating persons or organisations.

The above discussion sheds light on why good ethics require researchers to avoid harming participants during the process of the research by respecting and taking into account their needs and interests (Babbie 2013; Neuman 2011; Creswell 2014).

3.19 SUMMARY

Chapter three discussed the research methods employed in this study. The researcher chose the mixed method design for the study because it combined the qualitative and quantitative aspects in one methodology. This tended to enhance the understanding of the research questions. A mixed method approach offers richer insights into the phenomenon being studied and allows the capture of information that might be missed by using only one research design, and it enhances the body of knowledge and more questions of interest for future research. The research method used was the survey. The researcher chose this method because he wanted to listen to the voices of the respondents as a basis of investigating the problem better. The techniques used were questionnaires and interviews and the study was exploratory in nature.

A research onion was adopted to guide the range of choices, paradigms, strategies and steps followed by the researcher during the research process. Information was gathered through unstructured interviews for the qualitative phase, and an online survey for the quantitative part.

The methodological propositions discussed in this chapter are employed in the presentation and analysis of the quantitative and qualitative data in the following chapters.

In the next chapter, the need for an e-learning framework is explored.

CHAPTER FOUR: PRELIMINARY E-LEARNING FRAMEWORK

4.1 INTRODUCTION

The previous chapter discussed the research methodology used in this study and gave the reasons for selections in each layer of the onion. Based on the literature consulted, the need for an e-learning framework was established. This chapter seeks to develop a knowledge acquisition and construction framework for e-learning for Management Accounting students at the University of South Africa, which is an Open Distance Learning (ODL) institution that embeds an e-learning environment, often referred to as ODeL (Open Distance e-Learning). E-learning refers to the use of electronic applications and processes for learning, and includes the transfer of skills and knowledge over a distance (Nelson & Winter 2010). It is important to the knowledge construction process to understand how students learn in order to determine a set of suitable learning strategies. Guri-Rozenblit (2009) and Rudestam and Schoenholtz-Read (2010) have shown that, generally speaking, e-learning applications are little used, sometimes because of inappropriate content and technologies. Other prohibitive factors according to Ssekakubo et al (2011) are cost, poor or inadequate technology infrastructure (or a lack of access to such infrastructure) and a shortage of human resources. This chapter proposes a framework for addressing these concerns and considers how constructivism theories may enrich such a framework.

The layout of the chapter is as follows: Section 4.2 discusses ODL followed by Section 4.3, which portrays current developments. Section 4.4 debates some of the assumptions as motivated in the literature (Bates 2005). Section 4.5 introduces constructivism. Constructivism is said to support two types of learning: namely, any new form of learning like e-earning is supported better by this theory, and secondly, it is the preferred theory in qualitative approaches. Section 4.6 stresses the need for a Framework. Section 4.7 discusses suggestions synthesised from the identified problematic areas. Section 4.8 discusses challenges emanating from suggestions. Section 4.9 highlights the contributions of the analysis. Section 4.10 discusses observations whereas Section 4.11 indicates the analyses of the framework and Section 4.12 discusses further value added by the framework. The chapter concludes with a summary in Section 4.13.

The content of this chapter is a rework of one of the papers published in June 2012 (Kashora, van der Poll & van der Poll 2012).

The next section introduces ODL.

4.2 OPEN DISTANCE LEARNING

A well-known anecdote, which may coincide with the origin of the term ODL, is the story about Ali Baba who used a secret phrase to open a cave with treasures; the secret code was “Open O Simsim” or “Open Sesame” (Rudestam & Schoenholtz-Read 2010). Today, the magic word used to find online treasures is open, open education, open source software, open educational resources, open courseware initiatives, open platform, open Wikis, and ODL (Rudestam & Schoenholtz-Read 2010). ODL is becoming the secret code that may open educational treasures embedded in technology.

Theories of constructivism are advanced in support of learning technologies, while Web 2.0 applications seem to present a number of opportunities for constructivist learning. The constructivist approach is student-centred, and emphasises skills that support independent and self-motivated learning (Guri-Rozenblit 2009). Here, the student actively constructs knowledge by formulating ideas into words whilst others react and respond to these ideas (Harasim, Hiltz, Teles & Turoff 1995; Beckman et al 2014).

This chapter seeks to establish how e-learning can contribute towards knowledge acquisition and construction in Management Accounting and whether the use of technology can promote learning that is in line with these theories. Based on these concepts, a three-level framework is developed to help students acquire and construct the relevant knowledge in Management Accounting. The framework is coined the *Knowledge Acquisition and Construction Framework* (KACF). The next section paints a picture of some possible developments in e-learning and related technologies.

4.3 CURRENT DEVELOPMENTS

Laurillard (2002); Guri-Rozenblit (2009); Rudestam and Schoenholtz-Read (2010); Moore et al (2010) and van Rooyen (2015) reveal that developments in e-learning are inadequately employed in knowledge acquisition and creation in Management

Accounting for students in an ODL environment. The following further support this claim:

- There is an increasing gap between the skills expected of Management Accounting practitioners and those of management accountants who graduate from higher education institutions. It is plausible that the use of e-learning could remedy this situation.
- E-learning appears not to be utilised in Management Accounting education. It is plausible that Management Accounting education may benefit from these rapidly developing technologies.
- The “dot net” generation has grown up in a technological environment. It should be possible to integrate new learning technologies into their Management Accounting curricula.

This research sets out to establish how the advent of modern technologies may benefit teaching and learning in Management Accounting. These issues are addressed in the rest of the study through a suggested KACF. The following section states some of the assumptions in this research study.

4.4 ASSUMPTION

A common theme in the literature is that e-learning may well assist students to construct their own interpretations and ideas, the suggestion being that the quality and quantity of learning may be improved (Bates 2005; Beckman et al 2014). The claim that e-learning offers new possibilities for study and promote the quality of learning is, therefore, often taken for granted. The extent, to which ICTs can promote knowledge, using constructivist approaches to learning in Management Accounting, needs to be explored and investigated as is done in this research.

4.5 CONSTRUCTIVISM

Different researchers have understood constructivism differently. For instance, von Glasersfeld (1995) defines constructivism as a way of thinking, while Siebert (2002) claims that it is a theory; Lutz and Huitt (2004) consider the constructivist approach to teaching and learning as being based on a combination of cognitive psychology and social psychology. Constructivism or social constructivism is the preferred theoretical

approach in both qualitative research and online education (Payne 2009; Creswell 2014). The notion that knowledge is constructed has been termed constructivist epistemology whereas, in pedagogy, constructivism refers to a learning theory, teaching techniques or a general pedagogical approach. Constructivist pedagogy proposes a number of guiding premises (Cavana 2009:1-13):

- Instruction ought to take as a starting point the knowledge, attitudes and interests students bring to the learning situation.
- Instruction ought to be designed to provide (learning) experiences that effectively interact with student characteristics, so that students can construct their own understandings.

It is clear that constructivism places the creation of knowledge by the active student high on its agenda. Lecturers are seen as facilitators and co-constructors of knowledge, and students are active, self-regulated and self-directed students with a capacity to search, select and synthesise information and to construct their own knowledge and understanding (de la Harpe & Peterson 2009). In social constructivism, interaction and collaboration between students are seen as fundamental to learning, with knowledge being co-constructed during peer interaction and discussion. Despite the above positive sentiments about constructivism, some critics (de la Harpe & Peterson 2009:27-42) claim the following:

- Technology leads to isolation and separation from the real world.
- There is a lack of support for technologies generally, and there are no properly developed policies for teaching with these systems.
- Technology lacks the necessary theoretical frameworks to guide informed and sound practice.
- There is a lack of deep understanding of the relevant technologies by most educators; they view the use of technology as being synonymous with a great deal of additional work.
- A gap exists between empirically validated theories and pedagogical practices.

However, overall, the proposed framework may be applied in conjunction with constructivist theories. Web 2.0 has become a collective term for a movement in society, which is supported by web-based tools, resources and an environment.

Web 2.0 also sets the trend in the use of WWW technology in terms of creativity, information sharing and collaboration among users (Page & Kennesaw 2009). Constructivism may well contribute to the use of Web 2.0 applications such as social networking, blogs and wikis, podcasts (voice), and vodcasts (voice and video) (van der Poll & Dongmo 2012). The KACF attempts to link these applications at the implementation stage.

The following section postulates the need for an e-learning framework for knowledge acquisition and construction in Management Accounting, and incorporates the ideas and suggestions in Chapter 2, the current chapter, and other related literature sources.

4.6 THE NEED FOR AN E-LEARNING FRAMEWORK

The successful implementation of e-learning faces certain challenges (alluded to in section 4.3 above). These are summarised next, and are a lack of:

- Visual signals, logical sequences, emotive cues, and the need for social, cognitive, and teaching presences.
- Pedagogical tools to support online instructors.
- Access to the technology infrastructure.
- Human resources.
- Clearly defined purposes and functions of electronic media. This may be compared to putting technology at the forefront of pedagogy (rather than the other way round).
- Cost analysis of online courses, online study material, and online assessments.
- Clearly defined problems of the new technologies in Universities and colleges (Guri-Rozenblit, 2009).
- A learning environment that includes engaging learning activities that foster critical thinking skills, feedback, motivation, and support for students learning from each other.
- Direct teacher-student and student-student communication. These have remained challenges in distance education for centuries (Guri-Rozenblit 2009).
- Learning scaffolds.

A *learning scaffold* is a mechanism whereby students are given extensive support during the early stages of their learning, and such support is gradually reduced to

facilitate independent learning (Love & Fry 2006). Scaffolding enables students to build on their existing knowledge or to develop new learning strategies. To facilitate deep understanding, higher education may, therefore, have to adopt a more constructivist framework to enhance the learning experience (Laurillard, 2002). Since ICTs create an open pedagogical space where students and learning; and teachers and teaching all adopt new identities, it follows that online instructors of Management Accounting need to provide well-designed learning scaffolds that encourage independent and deep learning.

The consulted literature (Laurillard 2002; Bates 2005; Schank 2005; Goodfellow & Lea 2007) reveals some challenges, observations, and issues related to the implementation and application of e-learning environments.

These concerns are summarised in Table 4.1, and will now be further synthesised into a framework in Figure 4.1. For instance, in the framework, the first level consists of items that are critical to the success of the framework, while at the third level (implementation stage) possible benefits of the framework are highlighted.

Table 4.1: Synthesis for the framework

Author	Good ideas	Challenges	Contribution of research	Observations
Bates (2005); Schank (2005); Goodfellow & Lea (2007); Ssemugabi & de Villiers (2010)	Incorporate spreadsheet models, graphical images, and video into the classroom. Construct web pages and introduce topics on computer skills	Poor or insufficient technology infrastructure	Understanding how students learn may constitute a crucial part of selecting suitable teaching strategies	Practice is what matters: course designers need to design experiences and not courses.
Bates (2005); Goodfellow & Lea (2007)	Online instructors of Management Accounting need to provide well-designed learning scaffolds that	A lack of access to the technology infrastructure; a lack of human resource capacities	The computer has taken over the computational skills of the traditional accountant. A value-creating	Computer applications in accounting pedagogy have the potential to contribute to

Author	Good ideas	Challenges	Contribution of research	Observations
	encourage independent and deep learning		Management Accounting system might support decisions of managers	accounting education.
Laurillard (2002); Bates (2005); Goodfellow & Lea (2007); Schank (2005)	ICTs create an open kind of pedagogical space where students and learning, teachers and teaching all take new identities	Support and maintenance of infrastructure; Costs related to the training of staff	The process of concept formation, refinement, application and revision will be transparent to student peers and teachers in a manner that could enhance knowledge construction	
Wade (1999); Bates (2005); Goodfellow & Lea (2007); Schank (2005)	Web 2.0 technologies also have certain educational qualities that could enhance knowledge construction.	Inappropriate use of computers may be a detriment to learning accounting if students spend more time learning to use the hardware and software instead of learning accounting	The study may shorten the timeline for Web-based learning to become a pedagogical paradigm shift.	
Herdan et al (2017), Grabinski et al (2015)	Prepare students for the new world of technology.		Involve distance (online) learning with accounting students	

Table 4.1 reveals literature sources, which were consulted in order to come up with the framework. In other words, the framework is designed to become an affirmation or an answer to issues raised in Table 4.1.

4.7 SUGGESTIONS SYNTHESISED FROM THE ANALYSES

It is suggested that spreadsheet models, graphical images, and video be introduced into Management Accounting courses. Topics on computer skills, and how to construct web pages are further possibilities that have been identified. In other words, the modern management accountant has to be highly computer literate; measures, therefore, ought to be put in place to facilitate this. Online instructors of Management Accounting need to provide well-designed learning scaffolds that encourage independent and deep learning. Since ICTs create an open pedagogical space where students and learning, teachers and teaching all take new identities, an opportunity seems to present itself for Management Accounting to assume a new identity within the realm of e-learning.

4.8 CHALLENGES EMANATING FROM TABLE 4.1

Most of the challenges translate to a need for monetary resources required to finance specific projects. Poor or inadequate technology infrastructure would need to be upgraded to a satisfactory level, whereas a total lack of access to the technology infrastructure would require substantial funding (Ssekakubo et al 2011). Students as well as their lecturers both need a satisfactory level of resources. Costs related to the training of staff should help alleviate the lack of human resources, while the problems caused by the inappropriate use of computers should gradually diminish as students become more experienced in the use of computers.

4.9 CONTRIBUTIONS OF THE ANALYSES

Understanding how students learn may constitute a crucial part of choosing suitable tuition strategies: the type of pedagogy employed should take cognisance of this premise. Moreover, Web 2.0 technologies have certain educational qualities that could improve knowledge construction in a manner that is consistent with the constructivist approach. These qualities are embedded in blogging, wikis, e-portfolios, and social networks that allow students to clarify concepts, establish meaningful links and

relationships and validate their mental models. Similarly, a value-creating Management Accounting system might well support management decisions (once such a system has been incorporated into an organisation).

4.10 OBSERVATIONS

As stated earlier, “Practice means endless repetition not just trying something once” (Schank 2005:231), which is why course designers are encouraged to design experiences and not just courses. It appears that computer applications in accounting pedagogy have the potential to make a decidable contribution to accounting education. This would be in line with Laurillard’s (2002) study.

A synthesis of the above ideas into a three level structure, will give birth to the preliminary framework. The preliminary framework is developed to help students acquire and construct the relevant knowledge in Management Accounting. The framework is titled the KACF (refer Section 4.2). The KACF operates at the following levels: *Level 1* is the conceptualisation stage; some of the activities at this stage include understanding how students learn, constructivist theories, use of ICTs, and the concept of the Teaching and Learning Village. *Level 2* is the design actions: These were establishing suitable learning strategies, maintaining handwriting skills and facilitating ODL Knowledge Transfer. In order to summarise this section, one needs to consider the following items:

- Incorporate spreadsheet models videos graphics etc. into the teaching and learning of Management Accounting.
- Construct Web pages designed to address Management Accounting educational issues.
- Allow ICTs to create an open kind of pedagogical space for example ODeL in Management Accounting.
- Utilise educational qualities in Web 2.0 for the discipline of Management Accounting.

Level 3 is the implementation stage. This speaks to a variety of technologies and themes that can enhance e-learning models. These include the use of spreadsheets and web sites, the use of skype, satellites, wikis and social networks and incorporating learning scaffolds. The various chapters will attempt to highlight how these activities

may be incorporated into the e-learning environment. The hope is that, the identified factors could contribute towards the quality of the e-learning experience. But before these can be achieved, there are certain challenges to be managed:

- A lack of access to infrastructure
- The issue of human resource capacities.
- The issue of support and maintenance costs and,
- The inappropriate use of the technology that is likely to hinder the teaching and learning of Management Accounting.

All the above items (and others not mentioned here but are part of the framework) are informed by related literature sources in the literature section. Therefore, from the synthesis in Table 4.1, the following is a construction of the knowledge acquisition and creation framework in Figure 4.1:

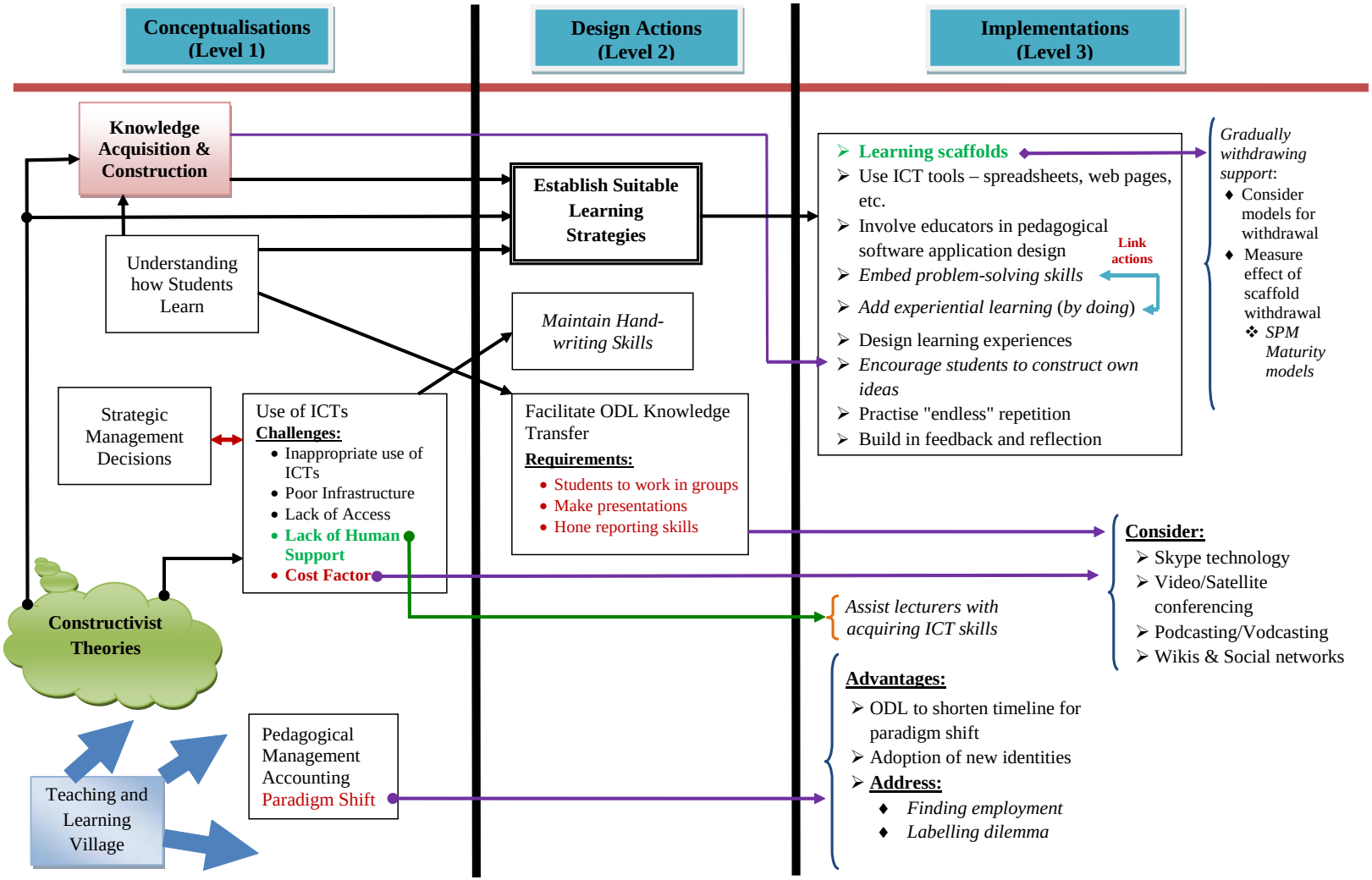

Figure 1: Knowledge Acquisition and Construction Framework

Figure 4.1: Knowledge Acquisition and Construction Framework (KACF)

Figure 4.1 KACF has three levels namely the conceptualisation, the design access and the implementation (at level 3) where most of the solutions come from its functionality and utility. The functionality and utility of this framework was tested through conference paper presentations (Kashora, van der Poll & van der Poll 2014).

A brief discussion of the framework follows.

4.11 ANALYSIS OF THE FRAMEWORK

The framework consists of three levels: conceptualisation, design, and implementation. Concepts addressed in this study, and solutions embedded in the framework are:

- The link between strategic management and the use of ICTs.
- Constructivist theories contributing to knowledge acquisition and creation.
- Learning scaffolds, the gradual withdrawal of such scaffolds and the measuring of the success of these actions by using Software Project Management (SPM) maturity models (Grant & Pennypacker 2006; Sukhoo, Barnard, Eloff & van der Poll 2007).
- Experiential learning and its relationship with problem solving.
- Student support through group work and making presentations through Skype technologies and video and satellite conferencing.
- Pedagogical shifts in Management Accounting.
- Employment and labelling dilemmas for students in Management Accounting.
- Assisting educators to become acquainted with the use of ICTs (so that they, in turn, can assist students).

An important component of the framework is the retention of traditional writing skills. Since paper could well remain the main source of information in education (at least for the foreseeable future), it is important that both lecturers and students retain their writing skills.

As per the framework, constructivist theories, as discussed in this chapter and in the literature review section, have a significant contribution to make to knowledge acquisition and construction. Suitable learning strategies also depend on having to understand how students learn. ICTs play a major role in online and ODL tuition, although these should not be used simply for the sake of using them – their real

benefits need to be fully exploited. The framework also includes the important aspect of designing learning experiences, the repetition of such experiences, the use of scaffolding, getting students to work in groups, and making presentations with for instance Skype, and video conferencing. The framework also acknowledges other pedagogical theories (see the three-level structure) like behaviourism and cognitivism.

Once adopted, the framework will be validated by measuring the knowledge acquisition and creation of a cohort of students in one or more courses in Management Accounting. In chapter six, a costing scenario is constructed which demonstrates the application of some of the concepts discussed in this study.

The majority of the mechanisms embedded in the framework are aimed at facilitating the learning process for students and in assisting them in making use of the available technologies. For example, the lecturers ought to be able to use these technologies just as effectively, if not more so. The framework caters for these needs by linking a lack of human support with assisting lecturers at the implementation level.

4.12 FURTHER VALUE ADDED BY THE FRAMEWORK

Once implemented, the framework is expected to yield a number of benefits to students and lecturers in Management Accounting, and to users of e-learning methodologies, researchers, and policy-makers of training and learning programmes, viz:

- The utility of the University of South Africa's (Unisa's) *my*Unisa environment could be evaluated using parts of the framework, leading to possible improvement for both *my*Unisa and the selected parts of the framework.
- This study can improve knowledge bases in the field of Management Accounting research.
- Use of the framework will test some pedagogical designs in e-learning and may contribute towards the utility of the designs.
- The framework can be used as a tool for further research in online Management Accounting education.
- Successes in using the framework may encourage policy-makers to implement e-learning methodologies in their institutions.

4.13 SUMMARY

This chapter sought to develop a knowledge acquisition and construction framework for e-learning for Management Accounting students at the University of South Africa. The ODL model is becoming popular with educational institutions because of its study anywhere, anytime context. Theories of constructivism are advanced in support of learning technologies, while Web 2.0 applications seem to present a number of opportunities for constructivist learning. The constructivist approach is student-centred, and emphasises skills that support independent and self-motivated learning. The successful implementation of e-learning faces certain challenges. A synthesis of the ideas into a three level structure gave birth to the preliminary framework. The preliminary framework was developed to help students acquire and construct their ideas into new or existing knowledge. Successes in using the framework may encourage policy-makers to implement e-learning methodologies in their institutions.

The next chapter highlights a number of Learning Management Systems (LMSs) that are used in online environments.

CHAPTER FIVE: LEARNING MANAGEMENT SYSTEMS

5.1 INTRODUCTION

The previous chapter introduced a preliminary framework in the form of the KACF. The design of this framework was informed by several literature sources. The current chapter compares and evaluates three LMSs, and attempts to establish how the framework can contribute towards the design principles of the LMSs.

Virtual Learning Environments (VLEs), also known as LMSs are being implemented by many higher education institutions in response to the increasing demand for online teaching and learning (Bri et al 2009). Open source software platforms such as Moodle, Sakai, and Claroline are among the most commonly implemented approaches (Lebrun, Docq & Smidts 2009). This chapter offers a comparison and evaluation of some of the popular VLEs/LMSs and on the strength of such analyses, establishes the desired properties of a LMS to organise the learning process in Open and Distance e-Learning (ODeL).

The layout of the chapter is divided as follows: Section 5.2 discusses the concept of a LMS while Section 5.3 expands this concept to include a Virtual Learning Environment (VLE). Section 5.4 introduces the *my*Unisa platform. Philosophies driving some LMSs are discussed in Section 5.5. The following three Sections 5.6, 5.7 and 5.8 discuss Moodle, Sakai, and Claroline respectively. Section 5.9 compares the three LMSs in terms of architecture and performance. Section 5.10 discusses the philosophies. Section 5.11 discusses further metrics of comparison, while Section 5.12 discusses the Sakai Platform and Section 5.13 is the summary of the chapter.

The content of this chapter was synthesised from a paper published in December 2014 (Kashora et al 2014).

5.2 THE CONCEPT OF LEARNING MANAGEMENT SYSTEMS

With the rapid advances in Internet technology and the WWW, higher education institutions have increasingly shifted their teaching and learning foci to ODeL and the accompanying online technologies (Guri-Rozenblit, 2009). In order to manage the multitude of technologies available to e-learning providers, LMSs (there were more than 250 LMS on the market in 2014, and by 2017, there were more than 600 LMS

solutions) have been developed during the past few years as platforms to handle student registrations; course management and delivery; assessment; and reporting (Dahlstrom & Bichsel 2016). The target market includes multinational corporations, universities, and government agencies. Dahlstrom and Bichsel (2016) report that a good LMS can, amongst other, increase the productivity of instructors and managers, improve on learning results and reduce costs of compliance.

In 2004, the University of South Africa (Unisa) took a decision to migrate from previous disparate LMSs to a new integrated LMS that was branded *my*Unisa. Subsequent to this decision, the Sakai framework was adopted (in June 2005), and six months later, user testing, based on this platform, was in progress (Myburgh & Sithebe 2006). The *my*Unisa e-learning environment has evolved steadily over the past 10 years up to what it is now, and it continues to evolve into the future as it adapts and incorporates changing circumstances. The *my*Unisa system is available to registered students at https://my.unisa.ac.za/.

According to Liebenberg et al (2012), 282,248 students had access to the *my*Unisa e-learning environment in 2011 out of 328,179 registered students. The *my*Unisa e-learning environment consists mainly of teaching and learning tools among other features. The university encourages such environment to be the primary and official means of communication between lecturers and students, e-tutors and students, and among students themselves. An e-tutor project started in 2013; according to this programme, each new student is linked to an e-tutor at registration (van Schoor 2013). There was an extensive programme to recruit e-tutors by Unisa in 2017. This chapter introduces LMSs in general before comparing and contrasting Moodle, Sakai, and Claroline platforms in some detail.

5.3 LEARNING MANAGEMENT SYSTEMS (LMSS) AND VIRTUAL LEARNING ENVIRONMENTS (VLES)

The literature makes no definite distinction between a LMS and a VLE. Technology platforms that support online teaching and learning use several (loosely equivalent) names such as LMSs, Collaborative Learning Environments, Course Management Systems, and VLEs.

The following definitions have been put forward:

- A VLE is a system that allows for learning materials to be made available to students via the WWW. Typical services offered include collaboration and communication tools; student tracking and maintenance; and assessment (McGill & Hobbs 2008).
- A LMS is a system which distributes interactive media, establishes channels of synchronous and asynchronous communication, manages the learning process, and facilitates the participation of students and teachers in an integrated way (Alves 2016).

This chapter adopts the terminology of an LMS to denote interchangeably a VLE as well. Therefore, the *my*Unisa system may be viewed as an instantiation of an LMS/VLE. Three prominent LMSs, namely, Sakai on which *my*Unisa runs and the Moodle and Claroline platforms are evaluated in this chapter. The utility of a previously developed framework is also considered with regard to how it satisfies the design principles of the LMSs presented in this chapter.

5.4 PHILOSOPHIES DRIVING SOME LEARNING MANAGEMENT SYSTEMS

Numerous LMSs are used in higher education, government and the corporate world. Examples of these LMSs are Moodle, Sakai, Blackboard, Claroline, Ilias, and Desire2Learn. In this research, the Moodle, Sakai, and Claroline platforms are discussed and compared. These three platforms have much in common: Each has its roots in academia; each of these is based on an open-source portfolio; each has a modular architecture; each supports the popular standards of SCORM (Sharable Content Object Reference Model) and each utilises efficient communication channels which encourage collaboration and interaction among students and instructors (Alves, Miranda, Morais & Alves 2012). One of the important outcomes emanating from these features is the efficient management of teaching, learning, and research both for on-site and distance students.

In general, a LMS should support the following: (Alves et al 2012):

- A centralised and automated administration.
- Self-services (preferably self-guided).
- Rapid assembly and delivery of learning content.

- Scalable web-based consolidation of training initiatives.
- Portability and adherence to standards, such as SCORM.
- Personalisation of content and enabling of knowledge reuse.
- Distribution of teaching aids and managing course content: A VLE allows students access to important course components, e.g. syllabus, additional reading, workshops and tutorials. Students should also be able to download learning materials such as images, audios, videos, and animations.
- Announcements: VLEs allow instructors to contact individuals, groups or the whole class enrolled for a specific course.
- Discussion forums: These allow participants, both students and instructors, to contribute discussions on the topic(s) raised.
- Submission of tasks: The e-learning platform facilitates instructor access to materials uploaded by the students, and vice versa; students can access their marked assignments and the solutions to assignments.
- Evaluating learning progress: VLEs provide for the development of online assignments, tests and exams, as well as setting dates and the time when students can take such assessments.
- Monitoring student activity per course: VLEs can maintain class lists, as well as other information like email addresses. Instructors can check the number of times that a particular student accesses a course or forum, and the duration of each access.

The following section introduces the three (3) prominent LMSs mentioned before.

5.5 MOODLE

Moodle started in academia, and continues to be a major player in the higher education market. Moodle is more pedagogy oriented while Sakai is more oriented towards collaboration. Moodle is an acronym for Modular Object-Oriented Dynamic Learning Environment. It is an open-source course management system that was designed using known pedagogical principles, and aimed at helping educators to create effective online learning communities (Bri et al 2009). Moodle is programmed in the Personal Home Page (PHP) programming language and it can, in principle, be installed on any computer that runs PHP. Moodle is a very popular free Course

Management System (CMS). The choice of a LMS is of relevance for any e-learning project that is intended to deliver didactic modules for higher education.

Below are some characteristics of the Moodle platform (Bri et al 2009):

- Promotes social constructivist pedagogy, consistent with the stipulation of the framework at level 1.
- Is suitable for online delivery and it can supplement face-to-face learning.
- Is easy to install on almost any platform that supports PHP. It requires just one shared database.
- Supports full database abstraction in the sense that it caters for all major brands of databases.
- Course listings give information of every course on the server, including accessibility to guests.
- Courses can be categorised and indexed – a single Moodle site can support very many courses.
- Security is maintained throughout.
- Most text may be edited via an embedded WYSIWYG (What You See Is What You Get) HTML editor.

Generally, Moodle is suited for lower resource organisations such as schools, small businesses, non-profit organisations, and local government agencies. One criticism sometimes levelled against Moodle is that it has many buttons and functionalities, which allow for complex functions, yet complicating simple tasks (Lebrun et al 2009). Another criticism is that its implementation code is untidy because of very many open-source developers over its development period.

The Sakai platform is discussed next.

5.6 SAKAI

Sakai is another free and open source platform that was built, and is maintained by the Sakai community. A consortium of five US Universities developed Sakai during 2004 and, presently, the Sakai Foundation manages it. It was first released to the public in 2005. Sakai is programmed in Java, it uses a modular architecture (Bri et al 2009), and it aims to integrate training and communication capabilities (Alves et al 2012).

The *my*Unisa e-learning environment is powered by Sakai, therefore, the features and tools of the Sakai Framework determine the tools and features of *my*Unisa.

The third LMS, namely, Claroline is discussed next.

5.7 CLAROLINE

Claroline was developed mainly from 2001 – 2002 and its aim was to promote pedagogic innovation at the Universite Catholique de Louvain (UCL) in Belgium (Lebrun et al 2009). Claroline, like Moodle, was developed in PHP, and released under an open source GPL licence. It has a modular design and it complies with SCORM requirements. Compliance with SCORM enables programs to run on different LMSs, and to use the Sharable Content Objects (SCO) in different course structures. The source code is clear, thereby facilitating the development of new functionalities. It is more learning-oriented rather than being communication-oriented. Claroline was developed following teachers' pedagogical experiences and needs (Lebrun et al 2009). It allows course managers to set up efficient resources aimed at knowledge and skills acquisition, and uses technology as a support for pedagogy. The framework offers several opportunities to incorporate technology at the implementation stage (wikis, podcasts, video and Skype technology).

The methodology adopted by Lebrun et al (2009) for Claroline is depicted in Figure 5.1. It shows information interacting with activities (abstraction, analysis, synthesis, evaluation, and critical thinking) as the student constructs knowledge.

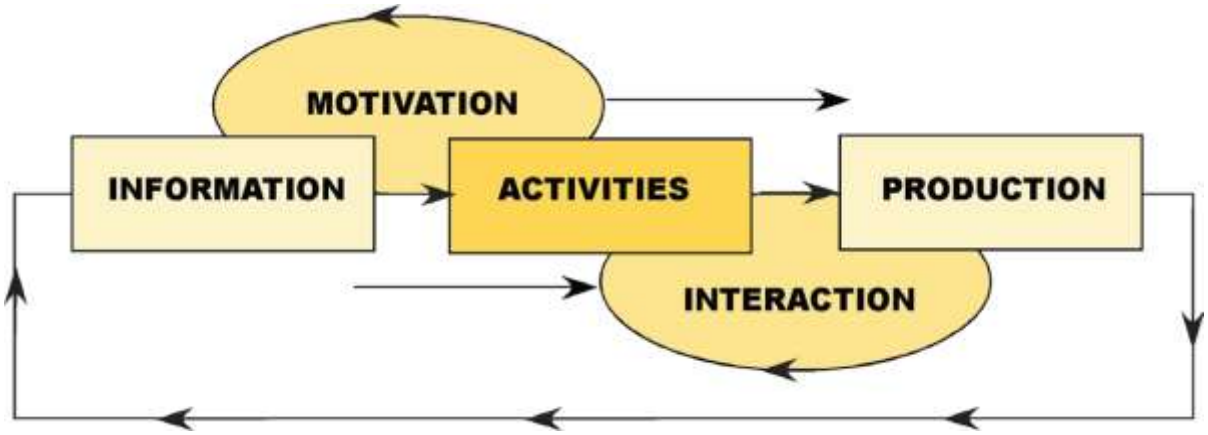

Figure 5.1: An ICT-based pedagogical development model

Source: *Lebrun et al (2009)*

Figure 5.1 gives an ICT-based pedagogical development model, which shows how interaction within activities and information and production takes place. Furthermore, Figure 5.1 was inspired and informed by a constructivist approach: information is, via students' activities transformed into knowledge, which feeds into a next set of information gathering processes (Lebrun et al 2009). The framework recommends constructivism as the theory of choice when it comes to technological applications and implementations; an often cited outcome of this approach is the deep understanding of the concepts at play.

Bri et al (2009) confirm that the effect of ICT in producing more active learning methods is substantial. Therefore, a LMS like Claroline facilitates the use of experimental methods by a lecturer in pedagogical innovations.

The Claroline platform is based on the teacher's needs which include (Pedagogical principles):

- Publishing documents and announcements,
- Giving students tools to develop activities and to demonstrate their skills,
- Allowing interactions among students and with teachers.

Next is a comparison of the above LMSs, using mainly the criteria in Fakhreldeen (2013).

5.8 COMPARISON OF THE THREE LMSS – MOODLE, SAKAI AND CLAROLINE

Table 5.1 gives a comparison of system requirements and architecture.

Table 5.1: System requirements and architectures

NO	SYSTEM REQUIREMENTS	MOODLE	SAKAI	CLAROLINE
1	Database	MYSQL, ORACLE	MYSQL, ORACLE	MYSQL
2	Operating system	ANY	UNIX, WINDOWS	LINUX
3	Programming language	PHP	JAVA	PHP
4	Webserver	ANY	APACHE	APACHE

NO	SYSTEM REQUIREMENTS	MOODLE	SAKAI	CLAROLINE
5	Application server	PHP4	TOMCAT	APACHE

Source: *Adapted from Fakhreldeen (2013)*

From Table 5.1 the following can be inferred:

- Programming language comparisons are complicated somewhat since Sakai is written in Java; the other two are written in PHP. Consequently, different system requirements (e.g. operating system or web/application server) may result.
- Apart from the Application Server, the Moodle LMS appears to be the most versatile of the platforms.

5.9 PHILOSOPHIES

Table 5.2 presents some of the common philosophies for Moodle, Sakai, and Claroline.

Table 5.2: Philosophies driving the learning management systems

NO	FEATURE	MOODLE	SAKAI	CLAROLINE
1	Open-Source Portfolio	Y	Y	Y
2	Modular Architecture	Y	Y	Y
3	SCORM Compliant	Y	Y	Y
4	Communication Channels	Y	Y	Y
5	Collaboration & Interaction	Y	Y	Y
6	Manage Teaching, Learning & Research	Y	Y	Y
7	On-Site and Distance Support	Y	Y	Y
8	Constructivist Theory	Y	Collaboration	Y
10	Client-Server Architecture & Cloud Capabilities	Y	Y	Y

Source: *Adapted from Fakhreldeen (2013)*

Table 5.2 gives philosophies driving the LMS; and it comes up with ten metrics namely, Open Source Portfolio, Modular Architecture, SCORM compliant, Communication Channels, Collaboration and Interaction, Managing Teaching, Learning, and Research, On-site and Distance Support, Constructivism and Client-Server Architecture & Cloud Capabilities. The LMSs are measured against each of these attributes as displayed in Table 5.2.

The following may be inferred from the literature and Table 5.2: Suri and Schumacher (2008) confirmed in a survey on Sakai, Moodle and Blackboard that Sakai is simpler to use but lacks some of the richer functionality available in Moodle and Blackboard (further analyses are beyond the scope of the study). However, some users argue that, naturally, with improved functionality, Sakai could become highly competitive. There is, therefore, a need to improve on the Sakai platform in order to have the capacity to respond to new educational requirements. Sakai should continue to improve its competitive features so that it can remain relevant in academia.

5.10 FURTHER METRICS OF COMPARISON

Table 5.3 shows additional metrics to be used in a comparison of the three LMSs.

Table 5.3: Metrics for comparing the learning management systems

NO	METRIC	MOODLE	SAKAI	CLAROLINE
1	Support	Y	Y	Y
2	Security	Y	Y	Y
3	Ease of use	Y	Y+	Y+
4	Management	Y	Y	Y
5	Interoperability	Y	Y	Y
6	Flexibility	Y	Y	Y+
7	Performance	Y+	Y	Y
8	Communication tools	Y	Y	Y

Source: *Adapted from Fakhreldeen (2013)*

Table 5.3 compares the metrics for the LMS. Those, which outperform in a particular area, are indicated with a “Y+.”

In Table 5.3, “Y” represents an acceptable (qualitative) level of the metric while “Y+” represents an even higher score.

The following are inferred:

- Sakai and Claroline score higher than Moodle in the category “Ease of use.”
- Claroline measures best on “Flexibility.”
- The “Performance” score of Moodle is the best of the three LMSs.

5.10.1 Verdict

The three platforms Moodle, Sakai, and Claroline each have many good features on offer; some score better than the others. The features are given in Tables 5.1 to 5.3 and the syntheses following each.

Ideally, an LMS should be developed that includes the best features of the three platforms combined – Moodle is preferred when it comes to system requirements and architectures; Sakai is best with respect to the underlying philosophies, while Claroline appears to be preferred when it comes to the metrics in Table 5.3. Therefore each platform has something unique to offer, hence the need for the development of a (new) LMS that incorporates the best features (and scores) of the three LMSs.

Before investigating the extent to which the KACF satisfies the design principles of the above three LMSs, an extended analysis into Sakai, the platform on which the *my*Unisa system of a large ODeL institution (Unisa) has been implemented, is performed.

5.11 SAKAI LEARNING PLATFORM

Sakai is considered the best of the three LMSs with respect to its reporting features. This holds also for the relative ease in which it may be customised and rebranded (Table 5.2), and for its collaboration characteristics (Table 5.3).

Bri et al (2009), however, report that Sakai falls short on profiling and management. They also report it to be challenging in integrating Sakai with other enterprise software systems. Another disadvantage usually associated with most open-source LMSs is that each can cost as much or even more than a commercial product. In particular, the costs for technology procurement and maintaining the infrastructure; training staff; and ongoing support may be as high as for a commercial product. Despite these

drawbacks, the Sakai e-learning Platform continues to penetrate the higher education market at an increasing speed and has distinguished itself from the competition by displaying some attractive characteristics.

The following are features provided by Sakai, as reported by various sources, e.g. the International Institute of Informatics and Systemics (http://www.iiis.org/); and Bri et al (2009):

- General student and lecturer collaboration features, e.g. wikis; course management and announcements; and RSS feeds.
- Typical teaching and learning characteristics, which allow lecturers to plan and construct lessons, create and assess assignments and share documents via cloud drop boxes. Naturally, the use of cloud technology (e.g. drop boxes) is essential in ODeL.
- Administrative management and portfolio tools.
- An initial list of options from where it is possible to access different learning resources (learning materials, discussion forums, notices, tasks, and assessment tests).
- A private folder for each group that enables members to upload and download homework, assignments, and specific documentation (the Sakai 2.5 e-learning platform) – another requirement of ODeL.
- Uploading of multiple documents simultaneously by lecturers.
- A Student's Portfolio, which can be customised by each student and be used to present course work and projects.
- Providing each user with a particular directory to share information with other students enrolled for the course (Sakai 2.5).

Next is an evaluation of the extent to which the KACF satisfies the design aspects of the LMSs addressed in this chapter. Such framework was first developed in Kashora, van der Poll, and van der Poll (2013), and its utility in terms of *technical subject* activities was illustrated in Kashora et al (2014).

5.12 EVALUATING THE UTILITY OF THE FRAMEWORK FOR AN LMS

The KACF contributes to the design principles of the LMSs through:

- *Skyping*: The framework encourages the use of Skype.
- *Teaching and learning (T&L):* The KACF addresses a number of requirements as reported on by Alves et al (2012). These include the use of synchronous (video conferences, real-time chats, and whiteboards) as well as asynchronous (e-mails, blogs, wikis, podcasts, and discussion forums) communication tools. The majority of these are also part of the *my*Unisa system on Sakai. Every student has a *my*Unisa email profile (*my*Life) and can communicate with administration and other registered students.
- *Constructivism*: The KACF can be useful in assisting students with their learning programmes. For example, the constructivist theories may be employed to encourage students to construct their own ideas, meaning, and understanding. These teaching and learning interactions are premised on the theories of constructivism.
- *Acquiring ICT skills*: Lecturers are to be assisted by improving on their ICT skills through pedagogical innovations. The *my*Unisa platform has an abundance of technology-rich functionalities. The lecturers need to be prepared to implement new methods that use ICTs. Such innovative ways would empower the lecturer as well as his/her methodologies in terms of technology. The framework acknowledges these requirements.
- *Scaffolding*: The *my*Unisa platform has an Additional Resources section, which often contains additional material to elaborate on subject concepts. This is an example of a learning scaffold as suggested in the framework.
- *Endless repetition*: The framework encourages practising endless repetition. The assignments and past examination questions on the *my*Unisa platform can fulfil this function for distance students (users).

5.13 SUMMARY

The current chapter compared and evaluated three LMSs, and attempts to establish how the framework can contribute towards the design principles of the LMSs. VLEs, also known as LMSs are being implemented by many higher education institutions in

response to the increasing demand for online teaching and learning. Open source software platforms such as Moodle, Sakai, and Claroline are among the most commonly implemented approaches by academia. After a comparison, evaluation and analyses of the LMSs, the desired properties to organise the learning process in Open and Distance e-Learning (ODeL) were suggested.

This chapter evaluated three (3) LMSs. The Moodle, Sakai, and Claroline platforms were evaluated with reference to their system requirements and architectures; underlying philosophies; and a number of additional metrics like ease-of-use, flexibility, and performance. It was found that each of the three platforms outperforms the other two in at least one of the features mentioned. Therefore, it is suggested that a LMS that incorporates the best features of the three platforms be designed.

In the next chapter, a conceptual evaluation of the framework is conducted.

CHAPTER SIX: CONCEPTUAL EVALUATION OF THE FRAMEWORK

6.1 INTRODUCTION

The previous chapter discussed LMSs, compared and evaluating three (3) of them, namely Moodle, Sakai, and Claroline. The characteristics of these LMSs were matched to the KACF in an effort to establish the desired properties that can enhance the learning process.

This chapter evaluates the utility of the KACF for acquiring and constructing technical subject knowledge by students in ODeL. The emphasis is on knowledge acquisition and construction of activities in total cost management, with an application in cost engineering. Course instructors employ Blogs, wikis, chat rooms, and other technologies such as scaffolding as they facilitate peer support and knowledge acquisition and construction. Before developing any online learning materials, educators ought to be well versed with learning and ODeL knowledge acquisition and construction principles. The roles played by behaviourist, cognitivist, and constructivist theories to facilitate knowledge acquisition and construction are unpacked. The knowledge acquisition and construction activities of students are classified by identifying the occurrences of such activities in the building blocks of the previously developed framework (See previous chapters). Critical success factors of parts of the knowledge acquisition and e-learning processes are established, and the generic aspects of such processes are identified through the said framework and a model for presenting a lecture for an ODeL course.

The rest of the chapter is divided as follows: Section 6.2 discusses ODeL space. Section 6.3 introduces utility of the framework while Section 6.4 discusses knowledge management frameworks in general. Section 6.5 discusses KACF. Section 6.6 explores understanding how students learn. Three theories of learning are mentioned and discussed in Section 6.7. Scaffolding is the next topic to be explored in Section 6.8. Online learning is discussed next in Section 6.9. Section 6.10 portrays a costing scenario. Section 6.11 concludes by validating the utility of the framework. The chapter concludes with a summary in Section 6.12.

6.2 OPEN DISTANCE ELECTRONIC LEARNING

The ODeL model is gaining popularity owing to its, often cited, *study anywhere and anytime* characteristic (Pastor, Hernández, Read, & Castro 2010; Simpson 2012). Despite the many advantages brought about by ODeL, it often faces demanding challenges because of its inherent distance-education component. Some concepts, especially those having a mathematical content (e.g. Total Cost Management (TCM) in an engineering discipline) are hard to convey adequately to students over a distance. Solutions for some instantiations of this challenge have been proposed, notably in the teaching of operating system concepts in Computing (van der Poll & Dongmo 2012), and it is envisaged that such techniques may be applicable in the teaching of concepts in TCM.

The assimilation of existing knowledge and the subsequent construction of new knowledge from known facts are important skills to be mastered by students. Thus, the development of a knowledge acquisition and construction framework was necessary in order to achieve this goal. A number of important developments and suggestions in the area of (online) tuition (Kashora, van der Poll & van der Poll 2016) further inspired the need for such framework. The aim of this chapter is to validate the utility of the framework by conducting a costing exercise as part of TCM.

The following sections aim to find answers to the questions posed.

6.3 UTILITY OF THE FRAMEWORK

The research reported on in this chapter is exploratory in nature in that it evaluates the preliminary framework in the previous chapter. Such framework was designed through a comprehensive survey of various components and aspects in the literature on acquiring and constructing subject knowledge in ODeL. Validation of the framework will be done through qualitative and quantitative surveys among students and lecturers at a large South African ODeL University – Unisa (Omona et al 2010). These initiatives are reported on in Chapter 7. The purpose of the current chapter is to determine the utility of the framework for assisting students to acquire and construct *technical subject knowledge* in ODeL.

6.4 KNOWLEDGE MANAGEMENT FRAMEWORKS

The framework in Figure 4.1 unpacks how knowledge may be acquired and constructed through e-learning. Critical success factors were identified in the literature and distilled into three (3) phases, namely, conceptualisation, design, and implementation. Conveying existing knowledge and the construction of new subject knowledge by students were the drivers of these phases. This is different from other knowledge management frameworks, which often address the business world, rather than higher education institutions (e.g. Kaniclides & Kimble 1994; Assegaff & Hussin 2012). The development of a framework ought to facilitate the organising of a complex subject, identifying the relationships between the parts and revealing the areas in need of further development (Moore & Kearsley 2012). Hence, it is assumed the framework will facilitate an understanding of the theories and practices of knowledge acquisition and construction.

6.5 KNOWLEDGE ACQUISITION AND CONSTRUCTION

Knowledge acquisition is the process of absorbing and storing information into (human) memory. Every student has to construct his or her own knowledge by processing and accommodating information, attitudes, or behaviours into previously existing cognitive, attitudinal or behavioural structures (Anderson 2008). Using blogs, wikis, chat rooms and other technologies, instructors should be able to facilitate peer support and student knowledge construction (Anderson 2008; Moore & Kearsley 2012). Blogs have been used by online students to create material reflecting on their learning experiences. These are a means of developing reflective skills, which may lead to enhanced learning.

A well-designed course should engage students in discussion, criticism, and knowledge construction, depending on the level of prior knowledge and experiences of the students. Conceptualisation (Level 1) in the framework addresses these aspects. Social networking technologies, e.g. Skype, blogs, and wikis facilitate collaboration and the sharing of ideas and experiences. Some scholars claim that group-based collaborative learning enables the development of learning communities in the short term and communities of practice in the long term (Anderson 2008; Moore & Kearsley 2012).

This research suggests that the affection, inclusion and sense of solidarity of a group are important characteristics in the successful social construction of knowledge online, hence, the Teaching and Learning Village component in the framework.

6.6 UNDERSTANDING HOW STUDENTS LEARN

The quest to understand how students learn has been a subject of research (and study) for a long time (Loeb, Miller & Strunk 2008). Recently this is being compounded by the need to understand how students learn in an online environment. An account of some of these activities appears in Haythornthwaite and Andrews (2011).

Piaget, Vygotsky, Skinner, Bloom, Pavlov, Bruner, Dewey, Kolb and Knowles; among many others, are some of the eminent personalities to have contributed to this conversation. The direction of a conversation in an educational relationship should be towards the improved understanding of the student (Moore & Kearsley 2012). Many theories on learning exist and education cannot happen without a theory. As a teacher, one may not even be aware of what the underlying theories are, yet they will be there. Carlile et al (2008) suggest that educational theory is the distilled experiences of others (O'Neill et al 2005). Some of the benefits of a theory can be found in the areas of Insight and Affirmation, Reflection, Problem-Solving, Sharing, Scholarship, Justification and Power.

Three (3) theories will be singled out for brief discussions in the KACF; these are behaviourism, cognitivism, and constructivism. Any of these theories may be applied at an appropriate stage within the framework. These three learning theories are so connected that it is hard to give an account of learning from a purely behaviourist point of view only excluding the other viewpoints. Arguably, it is better to assume the three traditions each have something to offer the theory of learning in combination with the others (Haythornthwaite & Andrews 2011).

6.7 THEORIES OF LEARNING

The theories of behaviourism, cognitivism and constructivism all contribute to the KACF. Each may be applied at appropriate stages within the framework, contributing to the theory of learning in conjunction with the others (Carlile & Jordan 2005; Sharpe, Beetham & De Freitas 2010). Behaviourism focuses on observable behaviour; learning is to show a reasonably permanent change in behaviour, while constructivist

learning is to see the meaning or significance of an experience or concept (Ashworth, Brennan, Egan, Hamilton & Saenz 2008).

Cognitive science came about as a response to behaviourism that was influenced much by the works of Pavlov and Skinner (O'Neill & McMahon 2005). According to Ashworth et al (2008), learning occurs when new knowledge is acquired or existing knowledge is modified by experience. Research in cognitive science confirms that knowledge obtained through activity is more useful than knowledge obtained through pure memorisation (Ashworth et al 2008).

Constructivism is a group of theories that can offer an explanation about how people learn. People construct their own semantics, building on previous knowledge and experience (Ashworth et al 2008). A constructivist (teacher) acts as a facilitator or mediator, and assists the student to discover meaning and understanding. In social constructivism, interaction and collaboration between students are seen as fundamental to learning with knowledge being co-constructed during peer interaction and discussion (Huang 2002). While constructivist theory is aimed at understanding and exploring the ways in which children learn, many researchers and instructors in higher education have applied constructivism to adult students (Phipps & Merisotis 2000).

The framework in this thesis gives cognisance to understanding how students learn during the conceptual phase already. Scaffolding during the implementation phase caters for the constructivist approach where the teacher acts as a facilitator or mediator.

6.8 SCAFFOLDING

The KACF proposes to adopt the concept of scaffolding during the implementation stage. The reason being that, educators and researchers have used the concept of scaffolding to describe and explain how adults and other peers can guide children's learning and development (Verenikina 2008). Scaffolding is the process where teachers use particular conceptual, material and linguistic tools and technologies to support student learning. In other words, the term scaffolding is used to capture the nature of support and guidance in learning that can assist a teacher's pedagogy.

6.9 ONLINE LEARNING

Anderson (2008) defines online learning as the use of the Internet to access learning materials; to interact with content, the instructor, and other students; and to obtain support during the learning process, to acquire knowledge and to construct personal meaning. It is anticipated that the use of ICTs (refer implementation phase) in the framework will play a central role in this regard. A key to successful online learning is to create learning environments that encourage collaboration. The collaborative design element of most Web-based education involves interactivity, resulting in student-centred instruction (Phipps & Merisotis 2000).

Researchers at the Institute for Higher Education Policy (Holmes & Gardner 2006) recommended that for effective online education, lecturers need to be assisted in the transition from classroom teaching to online instruction. In addition, online pedagogical strategies need to improve in tandem with technological sophistication (Phipps & Merisotis 2000). Some researchers believe that e-learning requires a new theory of learning. E-learning is dynamic; it is changing and adapting to new social situations, new politics, new technologies, and new forms of learning (Carlile & Jordan 2005; Sharpe et al 2010). The existing theories of learning do not seem to account fully for what happens in e-learning especially the “e” portion. E-learning, therefore, needs a dynamic and flexible learning theory since new technologies and new social practices are constantly interacting with learning (Carlile & Jordan 2005; Sharpe et al 2010). Learning will be seen as an effect of communities and their interaction, hence, the idea of a Teaching and Learning Village in the framework.

Technology and its associated theories may have, however, been criticised, since it may lead to isolation and dislocation from the real world. The use of technology is seen by many academics to be associated with additional work. There is also a lack of support and few well-developed policies for teaching with these systems. It is possible that the framework could address this challenge in that it makes provision for enhancing the ICT skills of teachers (Lack of human support – assisting lecturers in enhancing their ICT literacy).

The utility of some of the technical components (e.g. ICTs), of the KACF is illustrated next through an analysis of a Management Accounting costing exercise.

6.10 A COSTING SCENARIO

Over time, researchers and educational practitioners have been developing instructional material designed for the online environment. This section discusses the format of a lecture which is to be presented in the online medium to adult distance students. The format of a typical lecture is given in Figure 6.1. The format is adapted from Mittal, Pagalthivarthi, and Altman (2007).

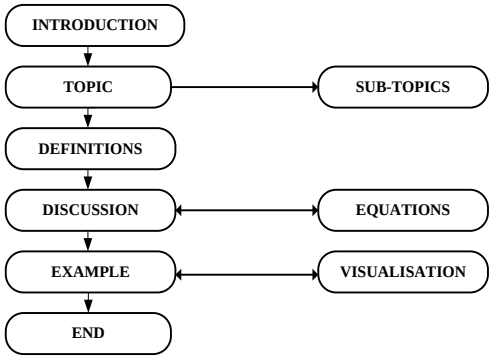

Figure 6.1: Model of a lecture

Adapted from: *Mittal et al (2007)*

The next section explores each of the actions in Figure 6.1 on the strength of an example, namely break-even point, a break-even analysis in a manufacturing application.

6.10.1 Break-even analysis

Break-even analysis is a TCM tool where the cost engineer needs to make decisions on production levels especially in a manufacturing environment. Following some definitions and a discussion, a worked example is used to illustrate the calculation of a break-even point. This is consistent with Fu and Buchanan (1993) – learning by example. The worked example will be posted as a blog, where after students are required to do similar exercises and post their answers for the instructor's attention.

6.10.1.1 Topic

The topic is break-even analysis. The related concepts are given in the following section.

Table 6.1: Topic and Sub topics

Break-even Analysis	
Sub topics	Break-even point
	Fixed costs
	Variable costs per unit
	Quantity
	Selling price per unit

Table 6.1 is in the form of the main topic (break-even analysis – heading), and the subtopics as indicated.

6.10.1.2 Definitions

As per the model, definitions particularly those relating to concepts of cost are presented next. After the discussion and equations, a worked example illustrates the calculation of a break-even point.

Table 6.2: Concepts and definitions

Concept	Definition
Break-even analysis	An analysis whereby a business (e.g. a factory) compares its revenues (sales) and costs in order to establish the feasibility of its production lines.
Break-even point	The point where profit is zero, that is, marginal income is equal to fixed costs.
Fixed costs	Costs paid irrespective of the level of production. Example: Rent of machinery, since it does not change from month to month. It normally remains invariant during a particular year.
Variable costs	Costs that vary directly with the number of units manufactured because more input is required in order to increase output. Example: Direct materials or Direct labour in e.g. manufacturing.
Direct costs	Costs that can be traced to a particular product.
Indirect costs	Costs that cannot easily be traced to a particular product.
Direct materials	All materials that form an integral part of the finished product and that can be included directly in calculating the cost of the product.

Concept	Definition
Direct labour	Labour expended to convert direct materials into a finished product.

Table 6.2 gives definitions of cost concepts that are used mostly in break-even analysis and calculations.

6.10.1.3 Discussion

The literature reveals that the constructivist approach is well suited to online instruction; therefore, constructivism is used in the framework. The other theories remain relevant and any good points from them may be incorporated. Since most distance students are adults (Phipps & Merisotis 2000) coming up with a winning strategy ought to be easier, given the positive attributes of adult learning groups. It also follows from the literature that collaborative learning and interactivity are encouraged in online courses; hence, the above lecture can be conducted online. Students would be encouraged to work interactively in groups and to post their solutions as a group. They would also be expected to participate in, and contribute to chat room discussions on the topic. All these fit in with the proposed framework.

Referring to the lecture layout, in Figure 6.1 the next aspect addresses equations.

6.10.1.4 Equations

The following are equations to be used in break-even analysis:

$$\text{Break-even point} = \frac{Fixedcostsintotal}{(Sellingpriceperunit - Variablecostperunit)}$$

$$\text{Break-even units} = \frac{Totalfixedcosts}{Marginalincomeperunit}$$

$$\text{Break-even value} = \frac{Totalfixedcosts}{Marginalincomeratio}$$

Example: Activity 1 - The following information is available (amounts for illustrative purposes only):

Table 6.3: Activity 1 - Cost per Item/Category

Item/Category	Amount (R)
Material cost to manufacture 1 unit	4.50
Labour cost to manufacture 1 unit	3.20
Factory rent	4,000.00
Indirect labour cost	2,200.00
Selling price per unit	22.00

Required: Calculate the number of manufactured units to be sold in order to break even.

Suggested solution

$$\text{Break-even point} = \frac{Fixedcostsintotal}{(Sellingpriceperunit - Variablecostperunit)}$$

$$= \frac{R6,200}{(R22 - R7.70)} = \frac{R6,200}{R14.30} = 433.57 \text{ units}$$

The break-even point may be represented graphically as in Figure 6.2.

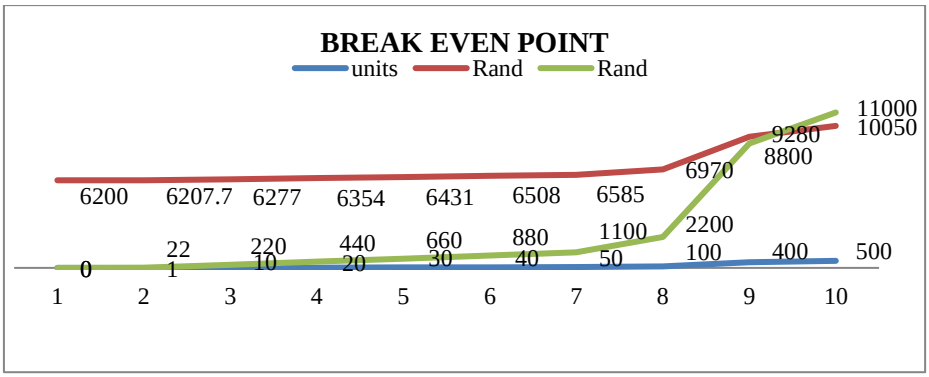

Figure 6.2: Break-even point

Figure 6.2 shows the break-even point (i.e. 433 units) that one needs to sell in order to break even.

Having worked out Activity 1, Activity 2 can be given to students to work out so that they can put to practice these newly acquired concepts.

Example: Activity 2 – The following information is available:

Table 6.4: Activity 2 – Cost per Item/Category

Item/Category	Amount (R)
Materials used to manufacture 20,000 units	200,000
Wages (factory workers)	50,000
Factory rent	90,000
Factory insurance	11,000
Salary (Factory Manager)	23,000
Selling price per unit	15

Required: Calculate the number of units to be sold in order to break even.

For ***Activity 2***, the facilitator could do part of the calculations and leave the rest to the students. For a next activity he/she may decide to let the class do all the calculations, either individually or in groups.

6.11 VALIDATING THE UTILITY OF THE FRAMEWORK

The proposed framework may facilitate a successful execution of the above break-even analysis exercises in a number of ways:

- *Maintain handwriting skills (Design):* For a first or 2nd attempt, encourage students to write out the calculations by hand.
- *ICT tools (Implementation):* Following on the above, encourage students to use a spreadsheet for the above calculations. Ask them to construct the graph in Figure 6.2 in (e.g.) MS Excel ™.
- *ODL Knowledge transfer (Design):* Make a podcast (voice) to tell, or a vodcast (video & voice) to tell and show how the calculations are done.
- *Scaffolding (Implementation):* Do a calculation fully for the students over a Skype session, or during a video/satellite conference. Do another one partially (e.g. ***Activity 2*** above) and ask them to supply the missing details. Let them do a 3rd example entirely on their own.
- *ODL Knowledge Transfer (Design) & Learning Experiences (Implementation):*

- During above scaffolding, let them work in groups (Design phase).
- Ask them to construct a learning experience by recording their thinking while performing a cost analysis, either in a group or individually.

- *Feedback and reflection (Design):* Discuss in the large group how the learning experience above may help them with subsequent tasks.
- *Practise "endless" repetition (Implementation):* Provide additional examples on the same topic. Ask them to construct their own examples with solutions. For each example, follow a selection of the above steps in the framework.

6.12 SUMMARY

This chapter evaluated the utility of a framework for acquiring and constructing technical subject knowledge in an ODeL setting. A framework was designed to assist in organising complex subject matter and identifying the relationship between the parts. A model for a lecture was used to test the utility of the framework. Theories of learning are discussed and their importance and relevance in an educational environment are highlighted. The complexity of the learning process, especially when it is compounded with the online model, may benefit from adopting a framework. For instance, the framework links a lack of skills with the development of human capacity at the implementation stage. The framework also has a teaching and learning village which equates to a community of practice.

Section 6.11 on validating the utility of the framework covers comprehensively how the framework can be of use to the student. The framework should be able to resolve some of the challenges that may be encountered during the implementation of e-learning.

In the next chapter, data presentation and analysis are displayed, and preliminary findings are revealed.

CHAPTER SEVEN: QUALITATIVE AND QUANTITATIVE EVALUATION

7.1 INTRODUCTION

Chapter six validated the utility of a number of technical aspects of the framework. An example of a lecture adapted from the literature was used for this process. This chapter presents data from interview sessions with four (4) Unisa lecturers in Management Accounting on their experiences and perceptions about how Unisa students are adapting to the e-learning environment. The interviews assisted the researcher to understand the lecturers' experiences, perceptions, and attitudes of online learning. The unstructured interviews also permitted the researcher to probe into areas and issues that cannot readily be captured in a quantitative survey. Lastly, unstructured interviews permitted lecturers the opportunity to provide comments and recommendations on how the university can improve the online learning environment for future online students.

The chapter also presents data gathered from second year Management Accounting students using an online survey. The responses to the interview questions were processed qualitatively while the online survey was processed quantitatively. The interview data was initially generated from descriptions of the participants' experiences and views on how Unisa students in Management Accounting incorporate e-learning (using the *my*Unisa platform) into their studies.

An excel spreadsheet was used to capture the data. This spreadsheet was later imported into Microsoft Word. The order represents the order of the twenty four questions. The four participants were labelled A, B, C and D. Responses were given verbatim after which they were indicated to be either an affirmative or a suggestion.

The rest of the chapter is divided as follows: Section 7.2 presents the analysis of the interviews. Section 7.3 discusses the qualitative findings while Section 7.4 presents the limitations. Section 7.5 is a presentation of the results while Section 7.6 concludes the chapter in a summary.

7.2 ANALYSIS OF THE INTERVIEWS

Responses were coded as either an “affirmation” or a “suggestion” using a “1” to indicate the presence of a code and a “0” to indicate that the response was not related to the code. Each response was linked to a formulated meaning and to a theme. The imported spreadsheet is presented in Table 7.1

Table 7.1: Interview responses

Order	Participant	Response	Affirmation	Suggestion
1	What would you regard as the major shortcoming of distance education?			
	A	Students don’t actively participate in study programmes due to other commitments. They tend to study towards exam times.	1	0
	B	Students do not utilise study material fully.	1	0
	C	There is no personal guidance in distance education. There is a need to show students step-by-step how to tackle questions.	1	0
	D	There is no face-to-face contact between the lecturer and student.	1	0
2	What barriers to learning did you experience in the traditional distance form of study?			
	A	The quality of primary education may be a barrier. More technology is needed in rural areas.	1	0
	B	In the past, students had limited access; e.g. phoning or writing letters. Now they can send SMS messages, and email. (Social media).	1	0

Order	Participant	Response	Affirmation	Suggestion
	C	The "facelessness" of distance education is a barrier. You do not know who to speak to?	1	0
	D	I don’t have any experience (with Unisa).	0	0
3	What other barriers can you think of in the traditional distance form of study?			
	A	I cannot think of any.	0	0
	B	There were no study groups; now there are study groups and forums.	1	0
	C	Geographic distance and connectivity are barriers. Language is also a barrier.	1	0
	D	I don’t have any experience (with Unisa).	0	0
4	What advantages of distance education did/do you experience?			
	A	If it is applied correctly, it can be effective.	1	0
	B	It afforded working people an opportunity to get a qualification.	1	0
	C	It makes you depend on yourself more in your area of study. (Be more mature).	1	0
	D	It gives a wider variety of students the opportunity to study.	1	0
5	How can we facilitate Management Accounting education so that students learn by doing?			

Order	Participant	Response	Affirmation	Suggestion
	A	This can be achieved if there is more active participation by students through assignments, group work, or other activities.	1	0
	B	Students have always been learning by doing; in the examples, assignments, or tests.	1	0
	C	Students would need more face-to-face contact, alternatively, through real-time guidance using technology.	0	1
	D	Management Accounting education already incorporates the learning for students by doing e.g. assignments and tests.	1	0
6	What new subject content can a student learn in the Management Accounting module?			
	A	Modules are designed to cover the study programs.	1	0
	B	Modules get updated with content prescribed by SAICA.	1	0
	C	In MAC2601, emphasis is on costing products and calculating profits under different systems.	1	0
	D	All relevant and "new" subject content is incorporated in the study material as prescribed by the professional bodies.	1	0
7	To what extent are Management Accounting graduates well prepared for the demands and expectations of the business world?			
	A	In theory, yes, but not in practice. There are some aspects that can only be learnt from practice.	1	0

Order	Participant	Response	Affirmation	Suggestion
	B	Students are prepared to pass outcomes stipulated in the programmes; they are taught soft skills, report-writing, and critical thinking.	1	0
	C	They learn to manage time by having to study in a limited time period. Students improve from being medium to being well organised.	1	0
	D	We prepare students for third year level, which adds further knowledge to the students' basic knowledge base and prepare them for the business world.	1	0
8	What is your definition of online learning?			
	A	Perform tasks without the physical presence of the lecturer.	1	0
	B	Blended learning uses a combination of traditional study material as well as the internet environment… We are not yet at the fully online stage because of numerous barriers.	1	0
	C	It is using the internet interactively during studies.	1	0
	D	The opportunity for students to be able to study using technology.	1	0
9	What are some of the factors that lead to disillusionment of the lecturer with new technologies?			
	A	Manual operations are still in force e.g. Administration.	1	0
	B	Students generally do not use the technology.	1	0
	C	The time-consuming nature of online delivery may lead to disillusionment of the lecturer.	1	0

Order	Participant	Response	Affirmation	Suggestion
	D	The systems are not working. They cannot handle the capacity.	1	0
10	What issues must a higher education institution address in order to facilitate the success of an online learning initiative?			
	A	There are registration complications which impact on the success of the programme.	1	0
	B	Students need to have easy and affordable access to the online environment.	1	0
	C	There is need to increase capacity in terms of human resources, and bandwidth.	1	0
	D	Ensure that sufficient data capacity is available to handle the number of students simultaneously.	1	0
11	How can mobile technologies be used by institutions and students to assist in distance learning?			
	A	This will be similar to how computers are used through email, and SMSs.	1	0
	B	The use of cell phones, SMS, emails, internet and *my*Unisa platform have vastly improved interactions (student-to-student, student-to-lecturer, student-to-content).	1	0
	C	Mobiles can be used to SMS relevant communication, to access online content and to address interactivity e.g. through "WhatsApp."	1	0
	D	Provides learning material "in the palm of their hands."	1	0
12	How can instructors be better equipped for e-learning?			

Order	Participant	Response	Affirmation	Suggestion
	A	Students need to be aware of the technology; be able to access the technology and know how to use the technology effectively.	0	1
	B	Instructors need relevant training and support on e-skills.	1	0
	C	Instructors can improve through the frequent use of the technology.	1	0
	D	By attending training on what is available, know and be able to use the available technology.	1	0
13	How proficient are the students in the use of the relevant computing technology?			
	A	Progress is about halfway at present…they should be more proactive than reactive.	1	0
	B	Differs from student to student and depends on availability of computer internet access.	1	0
	C	Those with proper access are very proficient, and those without exposure have limited efficiency.	1	0
	D	Some are proficient; others are not because they don't have access to technology.	1	0
14	Are there mechanisms for preparing both students and academic staff to use the available technologies effectively enough?			
	A	Yes, there are; through messages (email and SMS) and comprehensive instructions.	1	0

Order	Participant	Response	Affirmation	Suggestion
	B	Yes, there are. Students get detailed support, for instance through step-by-step instructions on how to carry out tasks.	1	0
	C	Yes, there are; students have access to the technology so that they can learn by experience.	1	0
	D	I believe for lecturers, yes, but not for students as they are all over the world.	1	0
15	What e-learning resources do you think should be made available for every student?			
	A	Access to hardware and software as well as detailed instructions for students.	1	0
	B	Every student should have all the study material or access to the study material via the internet and group profiles to interact with other students.	1	0
	C	Every student needs easy and free access to the equipment and connectivity.	1	0
	D	Every student needs internet access	1	0
16	What is your definition of a VLE?			
	A	This is the same as e-learning.	1	0
	B	All communication that is not face-to-face with the students.	1	0
	C	It is a substitute or complement for face-to-face instruction using technology means.	1	0

Order	Participant	Response	Affirmation	Suggestion
	D	The opportunity for students to learn with the assistance of videos.	1	0
17	Does the use of a VLE have a positive impact on student learning?			
	A	It does have a positive impact.	1	0
	B	It should if students made use of the VLE.	1	0
	C	Yes, but only if it is supported by face-to-face delivery.	1	1
	D	According to statistics, it increases the learning ability of students by 10%.	1	0
18	Does the use of a VLE for teaching and learning help develop student independent learning?			
	A	Yes.	1	0
	B	Most students want to be spoon-fed. They do not want to be independent.	0	1
	C	Yes, this links to the maturity mentioned earlier.	1	0
	D	I can’t answer this as I have no experience in this field. But maybe the answer is yes because of the statistics mentioned earlier.	1	0
19	Does the use of a VLE for teaching and learning facilitate the students' knowledge acquisition in the subject?			
	A	It depends on the course and the amount of self-study involved. If they apply it they benefit.	1	0
	B	If they use it, it would definitely have a positive effect.	1	0

Order	Participant	Response	Affirmation	Suggestion
	C	Yes, only for the committed active students.	1	0
	D	Maybe yes, because of the statistics mentioned earlier.	1	0
20	Does the use of a VLE for teaching and learning facilitate the student's knowledge construction in the subject?			
	A	Same as above.	1	0
	B	There is a need for the student to study first and then get help later.	1	0
	C	Yes, if this is complemented with face-to-face contact.	1	0
	D	Refer to answer 19 above.	1	0
21	What are the potential benefits of using online synchronous discussion with undergraduate students?			
	A	Students should have direct access to lecturers as well as their peers.	0	1
	B	Time and location to suit all involved in online synchronous discussion is a challenge. Students can request for a face-to-face tutorial if their number is 50 or more.	0	1
	C	There can be immediate corrective action taken by the instructors.	1	0
	D	Students are given an opportunity of real-time discussion with the lecturer and fellow students.	1	0
22	What are the potential limitations of using online synchronous discussion with undergraduate students?			
	A	Not everybody has access to technology.	1	0

Order	Participant	Response	Affirmation	Suggestion
	B	This depends on each student.	1	0
	C	If a student does not actively participate, he or she misses out.	1	0
	D	Students may not have access to the internet, or won't know how it works.	1	0
23	What are your perceptions of the use of an "online tutorial" versus the more traditional face-to-face tutorial?			
	A	Online is like a one way monologue, whereas face-to-face is two way.	1	0
	B	There is preference for a face-to-face lecturer. Online tutorials are still difficult to implement because of the numbers.	0	1
	C	It is important that students are given the option to choose online or face-to-face.	0	1
	D	It has a place as some students will not be able to attend the face-to-face tutorials because of time limits.	1	0
24	What recommendations would you make to educators delivering online tutorials to students?			
	A	Student feedback is important, more student participation is necessary for the success of this technology.	1	0
	B	In reality, online tutorials have not yet taken off (only 20 out of a 1000 students participate in online tutorials).	0	1
	C	There is a need to involve students so that they actively participate (utilising the scaffolding concept).	1	0

Order	Participant	Response	Affirmation	Suggestion
	D	Clear and on-time communication to students.	1	0

Table 7.1 summarises the responses from the unstructured interviews. Each question had four responses from each of the lecturers; there were twenty-four questions in total. Each of the responses was also coded, either as an “affirmation” or as a “suggestion.” Themes emerging from this data are displayed in Tables 7.2 and 7.3.

The themes were divided into two categories: those related to affirmations and those related to suggestions. Table 7.2 displays themes related to affirmations. These themes are derived from the statements, which have been coded “1.”

Table 7.2: Themes related to affirmations

Theme	Description/Statement
Lack of participation	Students don't actively participate
Other commitments	Students have other commitments
Study material use	Students do not utilise study material
Personal guidance	There is no personal guidance in distance education
Face-to-face contact	There is no face-to-face contact between lecturer and student
Quality	Quality of primary education is a barrier
"Facelessness"	You do not know who to speak to
Study groups	There were no study groups
Geographic distance	Geographic distance and connectivity are barriers
Correct application	If it is applied correctly, it can be effective
Working people	It afforded working people an opportunity to study
Self-dependency	It makes you depend more on yourself
Active participation	If there is more active participation
Learning by doing	Students have always been learning by doing
Face-to-face contact	Students would need more face-to-face contact
Study programs	To cover the study programs
Study content	Modules get updated with content
Subject content	All relevant and new subject content
Learn from practice	Can only be learnt from practice
Pass outcomes	Students are prepared to pass outcomes
Manage time	They learn to manage time

Theme	Description/Statement
Prepare students	We prepare students for third year level
Blended learning	Blended learning uses a combination of…
Internet use	It is using the internet interactively
Technology use	Students generally do not use the technology
Time-consuming nature	The time-consuming nature of online delivery
Registration complications	There are registration complications
Easy and affordable access	Students need easy and affordable access
Resources and bandwidth	Increase capacity in terms of human resources and bandwidth
Data capacity	Ensure there is sufficient data capacity
Improve interactions	Internet and *my*Unisa have vastly improved interactions
Access online content	Mobiles can be used to access online content
Training and support	Instructors need relevant training and support on e-skills
Frequent use	Instructors can improve through the frequent use of the technology
Proactive and reactive	They should be more proactive than reactive
Proper access	Those with proper access are very proficient
Access to technology	Students have access to technology
Access to computers	Access to hardware and software as well as detailed instructions for students
Access to study material	Access to the study material via the internet

Theme	Description/Statement
Easy and free access	Every student needs easy and free access

Table 7.2 listed the themes that are related to the affirmations. Table 7.3 displays themes that are related to suggestions. The suggestions tended not to answer the interview questions directly, but instead, offered a suggestion that could improve the situation. For instance, it is recommended, that online learning be complemented with face-to-face delivery if students are to benefit more.

Table 7.3: Themes related to suggestions

Themes	Description/Statement
Face-to-face contact	Students need more face-to-face contact
Technology literacy	Students need to be aware of the technology
Face-to-face delivery	Yes, but only if it is supported by face-to-face delivery
Spoon-feeding	Most students want to be spoon-fed. They do not want to be independent
Access to lecturers	Students should have direct access to lecturers as well as their peers
Request face-to-face	Students can request for a face-to-face tutorial if the number is 50 or more.

The suggestions portrayed in Table 7.3 are quite explicit. For example, the lecturers were of the view that generally, students needed more face-to-face contact, as they tended to perform better under such an environment. Where the students' number exceeded fifty, they could request for a tutorial group. The other suggestion was that students should have access to lecturers as well as other peers.

7.3 QUALITATIVE FINDINGS

The next section gives a report on the qualitative findings of the interviews. These results are reported under headings that align with the question in the interview instrument. Sometimes this heading revolves around a particular theme. Illustrative

quotations on the feedback of interview questions are selectively included. The responses reveal to some extent, the level of technology use or non-use.

7.3.1 Students' perspectives

E-Learning is viewed variously as having the potential to: improve the quality of learning; improve access to education and training; reduce the cost of education; and, improve the cost-effectiveness of education (Gilbert et al 2007). Dahlstrom, Brooks and Bichsel (2014) Gilbert et al (2007) and Grabinski et al (2015) do not seem to document the student experiences and their activities online. This research will attempt to contribute to the literature on the student experience of e-learning. It would, therefore, seem appropriate to focus attention on the student experience of e-learning and listen to students' voices in an effort to extend our knowledge of e-learning (Gilbert et al 2007). Investigating the ways that students perceive and interact with the learning environments, may result in a better design of the online learning environment. The literature reveals that students are very unsure about the tutor's role in e-learning. Perhaps they compare online learning with face-to-face contact. The students cannot judge the level of interaction that they can expect with the tutor (Carter, Salyers, Myers, Hipfner, Hoffart, MacLean, White, Matus & Forssman 2014). Lecturers of Management Accounting at Unisa are some of the participants who were interviewed in connection with this research. Some of their responses are documented in this section.

The lecturers held the following views about their students and the online environment:

- Students need to be aware of the technology; be able to access the technology and know how to use the technology effectively.
- Students generally do not use the technology.
- Students need to have easy and affordable access to the online environment.
- Student feedback is important, more student participation is necessary for the success of this technology.
- In reality, online tutorials have not yet taken off (only 20 out of a 1,000 students do participate).

From the above analyses, it is clear there is a need for students to engage the learning technologies wherever it is to their advantage.

When asked on how proficient the students were in using the relevant computing technology, the following were the lecturers' responses:

- Progress is about halfway at present, … they should be more proactive than reactive.
- Differs from student to student and depends on availability of computer internet access.
- Those with proper access are very proficient, and those without exposure have limited efficiency.
- Some [students] are proficient, others are not because they don't have access to technology.

The institution can establish computer centres in different geographical areas that will be accessible to registered Unisa students. All students should have equal access opportunities.

7.3.2 Instructors' perspectives

Research done on the nature and experience of online instructors (de Gagne & Walters 2009) identified four key themes: (a) work intensity, (b) role changes (c) teaching strategies and (d) professional development. These themes were linked to one another and, therefore, contributed to a broader picture of the instructors' experience (de Gagne & Walters 2009). The results of this study substantiate previous research. It would suggest, therefore, that the transition from chalkboard to a virtual environment requires faculty to adjust their pedagogy to effectively and efficiently facilitate learning at a distance. Professional development provides online educators with ongoing faculty development and training.

Delivering a course in an online environment requires different delivery methods as well as teaching and learning activities. In order to ensure this, training, support and guidance should be provided to faculty who are preparing to teach online (Lister 2014). The training and guidance should cover how to effectively use technology in the online environment, and how to effectively use the LMSs.

When lecturers were asked how they could be better prepared for e-learning, their responses were as follows:

- Instructors need relevant training and support on e-skills – by attending training on what is available, know and be able to use the available technology.
- Instructors can improve through the frequent use of the technology.

Instructors, therefore, need to be supported with the necessary exposure and training as suggested in the KACF.

There was a question about the factors that would lead to the disillusionment of the lecturer with the new technologies, and the following were the responses:

- Manual operations are still in force e.g. administration.
- Students generally do not use the technology.
- The time-consuming nature of online delivery may lead to the disillusionment of the lecturer.
- The systems are not working. They cannot handle the capacity.

When asked whether there were mechanisms for preparing both students and academic staff to use available technology effectively, the responses were:

- Yes, there are through messages (email and SMS) and comprehensive instructions.
- Yes, there are. Students get detailed support, for instance through systematic instructions on how to carry out tasks.
- Yes, there are; students have access to the technology so that they can learn by experience.
- I believe for lecturers, yes, but not for students as they are all over the world.

The institution should see to it that faculty and students have equal access and exposure to the available resources.

7.3.3 Online learning

A Canadian project known as the Meaningful E-learning or MEL project was conducted in 2012, a study to explore the e-learning experiences of both students and faculty. A mixed methods approach was used where researchers sought to discover teaching and learning activities that are effective, meaningful, and sustainable in the e-learning context (Carter et al 2014). The research revealed that e-learning experiences that

include opportunities for social interaction tend to influence learning outcomes positively. Moreover, inadequate technology skills were associated with resistance to e-learning by some faculty.

The researchers, Zhang, Zhao, and Tau (2008) studied factors that significantly influenced the acceptance and use of an e-learning system (Moodle) by students. The perceived ease of use (user experience) was found to be the most important factor, even ahead of perceived usefulness and security.

Lecturers commented about mobile technologies and shared their views about how online learning could be improved:

- Students need to have easy and affordable access to the online environment.
- There is need to increase capacity in terms of human resources, and bandwidth.
- Ensure that sufficient data capacity is available to handle the number of students simultaneously.
- The use of cell phones, SMS, emails, internet and *my*Unisa platform have vastly improved interactions (student-to-student, student-to-lecturer, student-to-content).
- Mobiles can be used to SMS relevant communication, to access online content and to address interactivity e.g. through "WhatsApp".
- Provide learning material "in the palm of their hands".

It follows, therefore, that the institution should engage in continuous research in an effort to improve upon its service delivery.

7.3.4 Face-to-Face learning

A face-to-face school or campus provides places for students to congregate socially; an online educational environment, therefore, should provide a space, such as a virtual café for informal discourse and social bonding. The forging of social bonds has cognitive benefits for the learning activities (Young & Duncan 2014). It needs to be emphasised that members depend on each other in order to achieve learning outcomes when studying courses online (hence the Learning Village on the Framework).

There was a definite preference for face-to-face contact as is evidenced by the following responses from lecturers:

- There is no face-to-face contact between the lecturer and student.
- The "facelessness" of distance education is a barrier. You do not know who to speak to.
- Students would need more face-to-face contact, alternatively, through real-time guidance using technology.
- It is important that students are given the option to choose online or face-to-face medium.
- Online is like a one way monologue, whereas face-to-face is two way.
- There is preference for a face-to-face lecturer. Online tutorials are still difficult to implement because of the numbers.

The preference for either face-to-face learning or online learning might be found in the blended learning model. It should be noted that students can request for a face-to-face tutorial if their number exceeds 49.

7.3.5 Blended learning

Blended learning is a mixture of online and face-to-face learning. The tendency is to blend the best aspects of online learning to the best of face- to-face; in so doing, a learning environment is created that is richer than either a traditional face-to-face environment or a fully online environment. There is a diversity of reasons for introducing blended learning, some are for financial and staffing reasons, yet some are for pedagogic reasons (Harding, Kaczyynski, & Wood 2005). Comparisons have been done on face-to-face and online learning with the main objective of improving each type of learning model. Researchers found no significant differences between online learning and the traditional face-to-face approach. Some researchers recommend flexible courses that integrate techniques from both face-to-face and online methods. Online and face-to-face instructional formats each have their own strengths and weaknesses. These strengths and weaknesses have been well documented, with the aim of improving both methods of tuition by reducing the weaknesses and maintaining the strengths. According to Berger, Eylon and Bagno (2008), online and face-to-face environments play different and complementary roles.

The next statement sums up one lecturer's view with regard to blended learning:

- Blended learning uses a combination of traditional study material as well as the internet environment … We are not yet at the fully online stage because of numerous barriers.

This section may be concluded with reference to Garrison and Vaughan (2008), who defined blended learning as the thoughtful fusion of face to face and online learning experiences.

7.3.6 Barriers to learning

A variety of themes can act as a barrier to learning especially in the online environment. The theme of human connection emerged as important to both students and teachers. Student-to-faculty and student-to-student interactions were considered important aspects of this human connection. Technology literacy is another emerging theme. The activities that could enhance technology literacy included an improvement in technology skills and IT support, a capacity to address issues as they occur as well as faculty developmental activities to enhance technical skills. Students should be taught to be more proficient with the technology for them to be more effective. The infrastructure needs included free internet access, user-friendly LMSs as well as technology-equipped classrooms. Faculty participants requested for in-service sessions and faculty development sessions as well as dedicated e-learning staff. The technical requirements included adequate bandwidth, up-to-date hardware, and innovative software. According to some researchers (Dahlstrom et al 2014) e-learning units should include instructional designers, professional development staff or educational developers, videographers, graphic designers, application developers and LMS experts.

Barriers that were cited during the interview sessions include:

- Geographic distance and connectivity are barriers. Language is also a barrier.
- The quality of primary education may be a barrier. More technology is needed in rural areas.
- The "facelessness" of distance education is a barrier. You do not know who to speak to.

More research needs to focus on problematic areas like the barriers mentioned in this section.

7.3.7 Collaboration and interaction

Collaboration and interaction are key ingredients in the learning environment. Analysis of research studies revealed the importance of designing opportunities for collaboration and interaction within online courses (Lister 2014). Interaction can be facilitated through discussion forums, chat, and email. Students value both student-to-student interaction, as well as opportunities for instructor-to-student interaction. Instructor-to-student interaction includes facilitating discussions, coordinating group work, and providing information. Overall, students value frequent opportunities for communication between students. Feedback is a special type of interaction between the instructor and student. There are many considerations in transitioning from traditional classroom teaching to teaching online (Lister 2014).

This section discussed in detail the qualitative findings of the research, giving a perspective that would not be possible with the quantitative approach.

Limitations are discussed next.

7.4 LIMITATIONS

The study has several limitations which are associated with the administration of the survey instrument. The method used of selecting every fifth record was convenient but not a perfect method for random sampling. However, the sample size was not necessarily a limitation, though the number of responses turned out to be a limiting factor. After sending out a thousand invitations, only a hundred responses were received. Even extending invitations to the total population of 5,884, the responses only increased to 147. Another limitation of this study was connectivity. The three application programs of yahoo.com, surveface.com and mendeley.com rely on connectivity. The researcher bias posed a limitation because prevailing attitudes and media influenced him.

7.5 PRESENTATION OF RESULTS FROM QUESTIONNAIRE

The researcher started sending the link to the survey in September 20015 and when it was apparent that no more responses from participants were likely (about October 2016), the survey results were taken to an expert (statistician) for further processing. There were 147 complete responses out of an original sample of 1,176 randomly selected participants. This gave a response rate of 13%. If a rate is calculated based on the total population of 5,884, the response rate becomes 2,498 or 2,5%. The statistician assisted with the processing of the results and computed percentages before grouping the outcome according to categories and constructs. These results were translated into frequency/percentage tables and column charts. After the Cronbach alpha coefficient were calculated to assess the reliability of the constructs in the questionnaire, the construct scores were calculated by taking the average of the reliable items that form part of the construct. These concepts and terms are discussed in detail in the next sections including highlighting their relevance to this research.

The survey was designed to solicit information pertaining to biographical variables, and the constructs of access to ICT infrastructure, ICT literacy, usability of *my*Unisa, use of ICTs in facilitating ODL, use of administrative functions and the construct on frequency of use (technological preferences). All these constructs, apart from the biographical information, are the subject of a KACF that was informed by the literature review (Kashora et al 2014). The survey instrument in Appendix A had a total of thirty seven Likert type statements. The responses to these items will assist in formulating answers to the research questions. Some of the research questions are repeated here so that the main objective of the research remains in focus:

- What pedagogical theories can be employed to enhance ODL knowledge acquisition in Management Accounting education and what technology can be deployed to support that type of pedagogy?
- How can web-based learning become a pedagogical paradigm shift? How can this paradigm shift be achieved in the context of Management Accounting?
- How can Management Accounting learning be facilitated so that students *learn by doing*? Which activities need to be included during the design stage of a Management Accounting course?

- How proficient are the students in the use of the relevant hardware and software? Do the students spend a significant amount of time learning to use the technology instead of learning Management Accounting concepts and principles?
- How can a full integration of IT into the Management Accounting courses be achieved? How are accounting graduates prepared for the computerised demands and expectations of the business world?
- How can Management Accounting educators participate in the design and development of software and material used for teaching issues?
- Can an open kind of pedagogical space be created in the e-learning environment in which students and learning, teachers and teaching and Management Accounting, all take new identities?
- What other questions should the researcher consider in order to perform this study?

The next section discusses the biographical information.

7.5.1 Biographic information

This section discusses the biographical information or characteristics of the respondents. These groups include gender, age group and race.

7.5.1.1 Gender

Out of one hundred and forty seven respondents (N=147), 57% were females while 43% were males. These proportions are consistent with those observed in similar studies (Schneider & Stern 2010). This information is depicted in Table 7.4.

Table 7.4: Gender distribution

Gender	N	%
Male	63	43.15%
Female	84	57.14%
All	147	100.00%

7.5.1.2 Age group (N=147)

The respondents are represented in five different age groups; namely those twenty years and below (3%), those between twenty one and thirty (39% rounded up), followed by the thirty one to forty age group (39%), the forty one to fifty age group (14%) and lastly the equal to or over fifty years group (5%). Table 7.5 displays information pertaining to age distribution of the respondents.

Table 7.5: Age distribution

Age	N	%
≤ 20 years	4	2.72%
21-30 years	57	38.78%
31-40 years	58	39.46%
41-50 years	21	14.29%
51+ years	7	4.76%
All	147	100.00%

7.5.1.3 Race group (N=146)

The race groups of the respondents are displayed in Table 7.6.

Table 7.6: Race group of respondents

Race	N	%
African	109	74.66%
Asian	3	2.05%
Coloured	6	4.11%
Indian	6	4.11%
White	20	13.70%
Other	2	1.37%
All	146	100.00%

7.5.2 Display of the constructs

The survey results are presented using descriptive statistics and displayed as frequency/percentage tables and column charts. These results are displayed in order beginning with the construct access to ICT infrastructure.

The numbering system adopted by the statistician is not being followed sequentially but logically. For instance Q11 might precede Q2 and V4 could appear before V2 etc.

7.5.2.1 Access to ICT infrastructure

Table 7.7 shows responses to statements about ICT infrastructure, which included connectivity challenges.

Table 7.7: Access to Infrastructure

	Strongly Disagree		Disagree		Neither		Agree		Strongly Agree	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Q11: I find that the use of *my*Unisa is generally affordable to me with regard to internet access	2	1.53%	10	7.63%	24	18.32%	63	48.09%	32	24.43%
Q8: I have access to a computer for use in my studies	2	1.53%	0	0.00%	6	4.58%	39	29.77%	84	64.12%
Q9: I sometimes experience connectivity challenges with the Internet	5	3.88%	19	14.73%	10	7.75%	74	57.36%	21	16.28%
Q10: I sometimes experience power failures making it difficult for me to study	13	10.00%	34	26.15%	25	19.23%	46	35.38%	12	9.23%

Table 7.4 shows that the number of responses on access to computer (93%) and Internet access (72%) were fairly high, but also was the number of responses on connectivity challenges (73%). There is a need to address the connectivity imperatives in order to enhance the e-learning experience. Though the number of responses on power failures (44%) were not as high, they are not necessary in a good learning environment. Berhanu (2010) warns that introducing e-learning without acknowledging the paradigm shift and setting up the required ICT infrastructure and efficient support mechanisms threatens e-learning developments.

Figure 7.1 gives a pictorial representation of the respondents' access to ICT infrastructure.

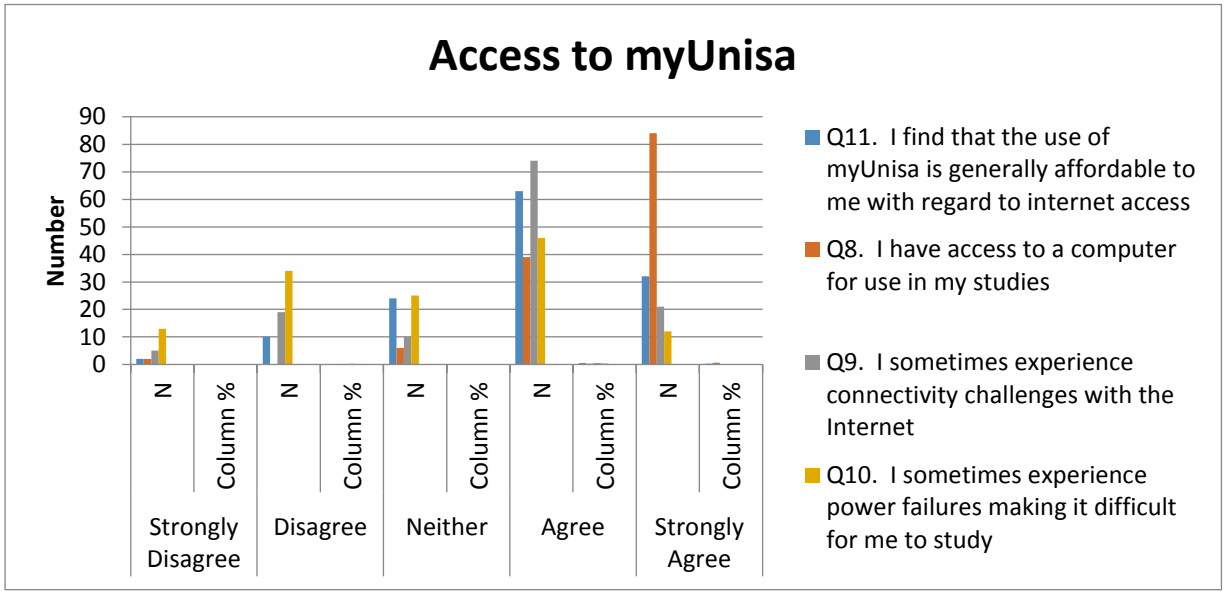

Figure 7.1: Access to ICT infrastructure (N=146)

Figure 7.1 displays the same information in the form of a column chart (multiple histogram). Prominent on the chart is the access to computers by respondents as well as the connectivity challenges. These metrics are not static, they are dynamic in nature and can change with time depending on other interactions at play. More research is required in order to establish the changing circumstances.

7.5.3 Descriptive statistics

Descriptive analysis consists of statistically describing and consolidating the constructs. The descriptive statistics were used to describe and consolidate the data being studied. The descriptive statistics about the individual items of the constructs was in the form of frequencies and percentages. The data was divided into a total of six constructs, namely, access to ICT infrastructure, ICT Literacy, usability of *my*Unisa, use of ICTs in facilitating ODL, use of Administration Functions and the construct on Frequency of use by respondents. These constructs are discussed in order in this section, except access to ICT infrastructure, which has already been commented on in the introduction.

7.5.3.1 ICT Literacy

ICT literacy is measured by the prior exposure that a respondent had to the Internet, e-learning and *my*Unisa. The percentages and frequency measurements on ICT literacy are displayed in Table 7.8.

Table 7.8: ICT Literacy

	Strongly Disagree		Disagree		Neither		Agree		Strongly Agree	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Q13: I have been exposed to the Internet before I started with my studies	4	3.10%	5	3.88%	2	1.55%	38	29.46%	80	62.02%
Q14: I have been exposed to e-learning before I started with my studies	14	10.85%	46	35.66%	14	10.85 %	29	22.48%	26	20.16%
Q15: The *my*Unisa platform is easily accessible to me	0	0.00%	6	4.65%	6	4.65%	60	46.51%	57	44.19%

Table 7.9 shows the percentage of respondents who had exposure to the Internet previously, and those who found it easy to access *my*Unisa.

Following next, each statement is repeated before being discussed respectively.

Q13: I have been exposed to the Internet before I started with my studies

91% of the respondents agreed with this statement about prior exposure to the Internet.

Q14: I have been exposed to e-learning before I started with my studies

Only 43% of the respondents had prior exposure to e-learning before embarking on their studies.

Q15: The *my*Unisa platform is easily accessible to me

91% of the respondents had easy access to the *my*Unisa platform.

These high percentages may be attributed to the e-tutor program, which started in 2013 and required every new Unisa student to be linked to an e-tutor at registration (Liebenberg et al 2012). However, exposure to e-learning was quite low at 43%. This low percentage is likely to change with time since the *my*Unisa platform is in effect a vibrant LMS "powered by Sakai". Chapter Five discussed Sakai and other LMSs.

ICT literacy can cover a range of issues including a lack of technical skills on e-learning and e-content development by the teaching staff. Wanyembi (2011) did a survey in Kenya and found that there was low ICT and e-learning skills among academics at universities. Teaching staff need to be trained on e-learning skills (Makokha & Mutisya 2016). However, teaching staff viewed their involvement in the development of e-content as being extra work with no additional pay, hence, their lack of interest and commitment in using e-learning. A lack of skills and sufficient human capacity have been cited as contributing to low e-learning implementation (Makokha & Mutisya 2016).

7.5.3.2 Usability of myUnisa

Table 7.9 shows the usability of *my*Unisa in the statements appearing in the task column. (V4, V2, V3 & V5 etc. form a logical order and not a numerical sequencing order.)

Table 7.9: Usability of *my*Unisa

	Strongly Disagree		Disagree		Neither		Agree		Strongly Agree	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
V4: The resources on *my*Unisa for Management Accounting are mainly for information purposes	3	2.33%	9	6.98%	34	26.36%	71	55.04%	12	9.30%
V2: The features on *my*Unisa are clear and easy to follow.	0	0.00%	3	2.33%	11	8.53%	75	58.14%	40	31.01%
V3: The structure of the options on *my*Unisa is easy to follow.	0	0.00%	2	1.56%	8	6.25%	82	64.06%	36	28.13%
V5: *my*Unisa has a positive impact on my effectiveness as a student.	1	0.78%	4	3.10%	19	14.73%	73	56.59%	32	24.81%
V6: I can learn more with *my*Unisa than without it.	6	4.65%	13	10.08%	26	20.16%	51	39.53%	33	25.58%
V7: For Management Accounting, the activities on *my*Unisa generally encourage me to engage with other students.	5	3.88%	18	13.95%	48	37.21%	42	32.56%	16	12.40%
V8: I am able to participate in discussion forums on the *my*Unisa platform.	3	2.33%	11	8.53%	26	20.16%	68	52.71%	21	16.28%

Each statement is repeated before being discussed respectively.

V4: The resources on *my*Unisa for Management Accounting are mainly for information purposes

When this statement was posed to the respondents, 55% agreed while 9% strongly agreed. However, 2% strongly disagreed, 7% disagreed and 26% were on the fence, neither agreeing nor disagreeing.

V2: The features on *my*Unisa are clear and easy to follow

Most respondents agreed with this statement (58%) while 31% strongly agreed. Nobody strongly disagreed, 2% of the respondents disagreed and 8% were neutral.

V3: The structure of the options on *my*Unisa is easy to follow

Again, none of the respondents strongly disagreed with the statement, 1% disagreed and 6% were neutral. The majority of the respondents agreed (64%) while 28% strongly agreed.

V5: *my*Unisa has a positive impact on my effectiveness as a student

Only 1% of the respondents strongly disagreed and 3% disagreed. The neutral ones constituted 14% of the respondents. On the other hand, 56% of respondents agreed and 24% strongly agreed.

V6: I can learn more with *my*Unisa than without it

This statement showed an increase in the percentage of respondents who disagreed as 5% strongly disagreed, 10% disagreed, 20% were neutral while 39% agreed and the remaining 25% strongly agreed

V7: For Management Accounting, the activities on *my*Unisa generally encourage me to engage with other students

Disagreement continue to be registered in this statement as 4% strongly disagreed, 14% disagreed and 37% were neutral. Those who agreed were only 32% while the ones who strongly agreed were 12%.

V8: I am able to participate in discussion forums on the *my*Unisa platform

This statement is similar to another one on discussion forums elsewhere in this analysis. The results are not as consistent, with respondents agreeing at 52% of the respondents and those who strongly agreed were 16% of the respondents.

The *my*Unisa platform is a LMS driven by Sakai. An instructor uses e-learning on this platform to distribute resources and facilitate interactions and use mobile technology for students' communication (Venter, Janse van Rensburg & Davis 2012). The *my*Unisa platform was mainly used for administrative purposes and as a passive observer, and was not fully utilised to its learning potential (Bagarukayo, Weide, Mbarika & Kim 2012).

According to Dahlstrom et al (2014) and Grabinski et al (2015), the evolution of LMSs provided infrastructure that support online course offerings. The quality and ease of use of the LMS contributes to the ultimate success and satisfaction of an e-learning course, thus making it easier to develop online courses that incorporate a variety of learning resources (Murray et al 2012).

7.5.3.3 Use of ICTs in facilitating ODL

The use of ICTs in facilitating ODL is captured in Table 7.10.

Table 7.10: Use of ICTs in facilitating ODL

	Strongly Disagree		Disagree		Neither		Agree		Strongly Agree	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
V10: The opportunity to learn using *my*Unisa at a time, place and pace to suit myself encourages me to learn independently.	2	1.56%	9	7.03%	10	7.81%	68	53.13%	39	30.47%
V11: The opportunity to be in control of my learning via *my*Unisa to learn at a time, place and pace that suits me, improves my learning experiences.	0	0.00%	9	7.03%	13	10.16%	70	54.69%	36	28.13%
V12: *my*Unisa is an important and valuable aid to me in my studies.	0	0.00%	2	1.56%	11	8.59%	78	60.94%	37	28.91%
V13: *my*Unisa improves the quality of my learning	0	0.00%	6	4.69%	26	20.31%	71	55.47%	25	19.53%
V14: The way in which Management Accounting is set up on *my*Unisa encourages me to learn independently.	6	5.41%	10	9.01%	41	36.94%	54	48.65%	0	0.00%
V15: The study material on *my*Unisa enables me to construct my own understanding of the subject matter. 7	2	1.59%	9	7.14%	20	15.87%	77	61.11%	18	14.29%
V16: The study material on *my*Unisa enables me to construct my own meaning of the subject matter. 8	2	1.57%	6	4.72%	26	20.47%	79	62.20%	14	11.02%
V17: The additional resources section allows me to understand difficult subject content as it develops the content from the simple to the	4	3.15%	11	8.66%	28	22.05%	68	53.54%	16	12.60%

	Strongly Disagree		Disagree		Neither		Agree		Strongly Agree	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
complex. 9										
V18: I am able to “practise endless repetition” by working out assignment questions and past examination papers that are posted on the *my*Unisa learning environment. 10	2	1.56%	4	3.13%	20	15.63%	85	66.41%	17	13.28%
V19: The *my*Unisa learning platform is structured in a manner that exposes students to opportunities for experiential learning.	1	0.80%	7	5.60%	30	24.00%	70	56.00%	17	13.60%

Table 7.10 summarises responses from students to the statement posed on the use of ICTs in facilitating ODL. Each of the statements is rewritten in full before commenting on the results of the questionnaire.

V10: The opportunity to learn at a time, place and pace to suit myself encourages me to learn independently

When respondents were posed with this statement, those who agreed, including the ones who strongly agreed, constituted 85% of the respondents while only seven percent disagreed and 8% were neutral.

V11: The opportunity to be in control of my learning via *my*Unisa, to learn at a time, place and pace that suits me improves my learning experience

Again, focusing inclusively on the respondents who agreed with the statement were 82% of the respondents. 7% disagreed while 10% were neutral.

V12: *my*Unisa is an important and valuable aid to me in my studies

The majority of the respondents agreed (88%), 2% disagreed and 8% were neutral.

V13: *my*Unisa improves the quality of my learning

Most respondents (74%) agreed that *my*Unisa improved the quality of their learning. 5% of the respondents disagreed while 20% were neutral.

V14: The way in which Management Accounting is set up on *my*Unisa encourages me to learn independently

A few respondents disagreed (14%) with this statement on the layout of Management Accounting while 36% were neutral. On the other hand, the respondents who agreed with this statement were a mere 48%. No respondent strongly agreed with the statement.

V15: The study material on *my*Unisa enables me to construct my own understanding of the subject matter

Three quarters of the respondents agreed with the statement about constructing their own understanding of the subject matter. Fifteen percent of the respondents were neutral.

V16: The structure of material on *my*Unisa enables me to construct my own meaning of the subject matter

Most respondents agreed with this statement (73%) whilst the number of respondents who were neutral was also high (20%)

V17: The additional resources section allows me to understand difficult subject content as it develops the content from the simple to the complex

The additional resources did not seem to appeal to the respondents as 11% disagreed and 22% were neutral. The respondents who agreed stood at 65%.

V18: I am able to "practice endless repetition" by working out assignment questions and past examination papers that are posted on the *my*Unisa learning environment

Respondents who engaged in endless practice were in the majority comprising 79% of the total. However, 15% of the respondents were neutral.

V19: The *my*Unisa learning platform is structured in a manner that exposes students to opportunities for experiential learning

A significant number of respondents (69%) agreed with the statement on experiential learning. Also, a large proportion of respondents (24%) were neutral to this statement. Apart from the statement on Management Accounting discussed earlier, this was the second statement to be poorly rated by respondents. These remarks are important in terms of pedagogy as they can point planners to areas of need.

7.5.3.4 Use of Administrative Functions

Table 7.11 displays the results of the responses to the construct on use of administrative functions on the *my*Unisa platform.

Table 7. 11: Use of administrative functions

	Strongly Disagree		Disagree		Neither		Agree		Strongly Agree	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
V21: I do my registration online on *my*Unisa at the beginning of each academic year. 2	4	3.15%	4	3.15%	4	3.15%	42	33.07%	73	57.48%
V22: *my*Unisa enables me to download study material and assignment questions. 3	0	0.00%	1	0.78%	1	0.78%	49	38.28%	77	60.16%
V23: I submit/resubmit my assignments on *my*Unisa. 4	1	0.79%	1	0.79%	0	0.00%	38	29.92%	87	68.50%
V24: I can track parcels from me to Unisa on the *my*Unisa platform. 5	5	3.94%	5	3.94%	25	19.69%	40	31.50%	52	40.94%
V25: *my*Unisa gives me access to past examination papers. 6	1	0.78%	1	0.78%	3	2.34%	52	40.63%	71	55.47%
V26: Examination results are published on the *my*Unisa platform.	1	0.78%	2	1.55%	2	1.55%	42	32.56%	82	63.57%

Each of the statements is rewritten in full before commenting on the results of the questionnaire.

V21: I do my registration online on *my*Unisa at the beginning of I each academic year

91% of the respondents did their registration online at the beginning of the year.

V22: *my*Unisa enables me to download study material and assignment questions

98% of the respondents agreed that they downloaded material and assignment questions.

V23: I submit/resubmit my assignments on the *my*Unisa

98% of the respondents submitted their assignments on *my*Unisa.

V24: I can track parcels from me to Unisa on the *my*Unisa platform

Only 72% of the respondents tracked parcels on the *my*Unisa platform.

V25: *my*Unisa gives me access to past examination papers

96% of the respondents confirmed that they were able to access past examination papers on *my*Unisa.

V26: Examination results are published on the *my*Unisa platform

96% of the respondents agreed with the statement on publishing the examination results.

The number of respondents who agreed with the features on administrative functions ranged from 91% to 98%. It was clear that the majority of respondents were aware of, or used the features on *my*Unisa. The number of respondents who tracked parcels on the *my*Unisa platform was 72%. This was the lowest rating for this construct.

The high ratings may be attributed to the e-tutor programme and the online registration requirements (Van Schoor 2013; Liebenberg et al 2012). Bagarukayo and Kalema (2015) revealed that the *my*Unisa platform was used mainly for administrative purposes and was not fully utilised to its learning potential.

7.5.3.5 Frequency of use

Table 7.12 displays how respondents engaged with some technological options on *my*Unisa.

Table 7.12: Frequency of use

	Never		Rarely		Sometimes		Often		Always		All	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
V28: I use quizzes on *my*Unisa	48	37.80%	26	20.47%	29	22.83%	21	16.54%	3	2.36%	127	100.00%
V29: I use blogs on *my*Unisa	56	43.75%	35	27.34%	24	18.75%	12	9.38%	1	0.78%	128	100.00%
V30: I use hyperlinks on *my*Unisa	38	29.69%	28	21.88%	34	26.56%	22	17.19%	6	4.69%	128	100.00%
V31: I participate in discussion forums on *my*Unisa	22	17.32%	33	25.98%	38	29.92%	25	19.69%	9	7.09%	127	100.00%
V32: I get feedback to my assignments on *my*Unisa	7	5.47%	4	3.13%	15	11.72%	21	16.41%	81	63.28%	128	100.00%
V33: I use podcasts on *my*Unisa	52	40.63%	25	19.53%	24	18.75%	16	12.50%	11	8.59%	128	100.00%
V34: I use vodcasts on *my*Unisa	62	49.60%	22	17.60%	19	15.20%	11	8.80%	11	8.80%	125	100.00%

This section discusses the frequency of use (technological preferences) of respondents as depicted in Table 7.12. The proportion of respondents who always and often participated in quizzes was 18% while those who always and often used blogs on *my*Unisa were a mere ten percent. Hyperlinks were used always and often by 22% of the respondents while those who always and often participated in forums were 26%. The respondents who always and often got their feedback on *my*Unisa rose to 79% further affirming the level of preferences of some technological options among respondents. Very few respondents always and often used podcasts (20%) and vodcasts (16%) at the time that the questionnaire was sent to the registered students.

Generally, the respondents who preferred these technologies were quite few, except those who got feedback on *my*Unisa (79%). Feedback is an important form of interaction in the learning environment. For instance, student-instructor interaction refers to the interaction between the student and the instructor. This can also take a variety of forms, for example, the instructor delivering information, or encouraging the student or providing feedback (Sher 2009).

The descriptive statistics used in this research were frequency distribution, measures of central tendency (mean, median, and mode) and dispersion. The mean was only calculated for the composite construct scores.

A normal distribution curve about the composite construct scores occurs when a quantitative variable is distributed at random (Koziol, Beljan, Bree, Mather & Barker, 2016). The skewness and kurtosis of a normal distribution both have a value of zero. The values of skewness and kurtosis in the results indicate that responses were not normally distributed. Cronbach's Alpha was used to measure reliability of constructs. The range and standard deviation show that the data was roughly spread around the mean. Frequency of use showed the most standard deviation of 0.83 and administrative functions had the least standard deviation of 0.52. The results of the percentages displayed in the preceding sections are now summarised in Table 7.13 as the averages of the individual construct scores. The highlighted figure of 3.93 is the nearest to 4.00, which is the expected construct average.

Table 7.13: Descriptive measures of central tendency

Variable	Mean	Standard deviation	Upper limit	Lower limit	Skewness	Kurtosis
ICT Literacy	3.93	0.79	4.07	3.79	-0.66	0.71
Facilitate knowledge	3.84	0.59	3.94	3.74	-0.73	1.93
Frequency of use	2.59	0.83	2.73	2.44	0.34	-0.54
Administrative function use	4.45	0.52	4.54	4.36	-1.25	3.59
Usability of *my*Unisa	3.82	0.53	3.92	3.73	-0.19	0.60

Figure 7.2 is a histogram showing the distribution of the ICT literacy scores. Most respondents on ICT literacy agreed with the statement (3.93 is near 4 which is agree).

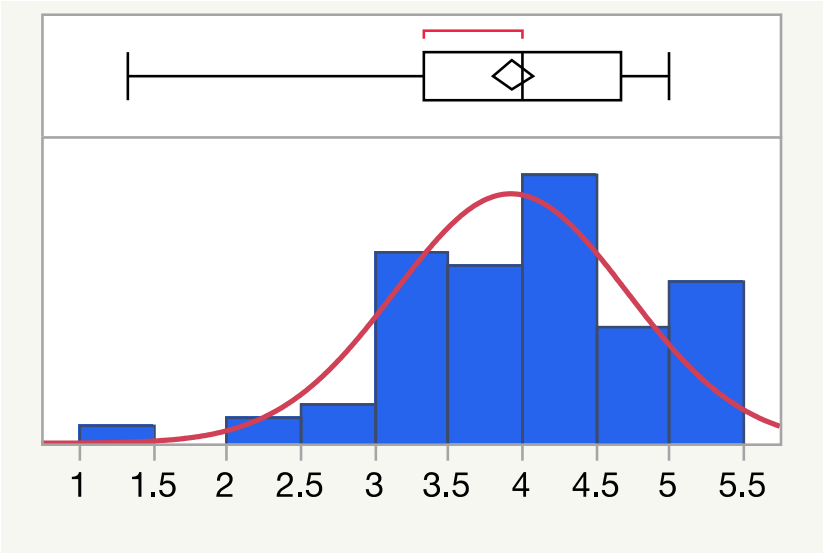

Figure 7.2: ICT literacy

7.5.4 Relationship between constructs

The correlation coefficient provides a measure of the strength and direction of a linear relationship between two variables. The relationship can be a straight line or a curve, and correlation measures the strength of this relationship. In order to establish whether there is a relationship between two variables, a graph called a scatter diagram is

drawn, giving a visual indication of the relationship. One of the variables will be independent, and the other will be a dependent variable.

The results of a correlation analysis is a number called a correlation coefficient. A correlation coefficient will always have a value between -1 and +1. A value of +1 is a perfect positive correlation while a value of -1 means perfect negative correlation. A value of zero suggests no relationship at all. There are two correlation coefficients in general use namely Spearman's rank correlation coefficient (for ordinal data) and Pearson's correlation coefficient (for quantitative data). The researcher proposes to use Pearson's correlation coefficient for this quantitative analysis (Unisa 2016).

Table 7.14 displays a symmetric representation of the correlation coefficients of the constructs.

Table 7.14: Multivariate correlation

	ICT literacy	**Facilitate knowledge acquisition**	**Frequency of use**	**Administrative function use**	**Usability**
ICT literacy	1.0000	0.1905	0.2096	0.2033	0.2048
Facilitate knowledge acquisition	0.1905	1.0000	0.3654	0.2890	0.7573
Frequency of use	0.2096	0.3654	1.0000	0.3141	0.3441
Administrative function use	0.2033	0.2890	0.3141	1.0000	0.3305
Usability	0.2048	0.7573	0.3441	0.3305	1.0000

There are 3 missing values. The correlations are estimated by REML method.

A correlation coefficient of 0.7573 indicates a strong positive relationship between the variables of usability and facilitating knowledge acquisition.

Table 7.15 gives the correlation probabilities of the constructs.

Table 7.15: Correlation probability

	ICT literacy	Facilitate knowledge acquisition	Frequency of use	Administrative function use	Usability
ICT literacy	<.0001	0.0306	0.0176	0.0214	0.0199
Facilitate knowledge acquisition	0.0306	<.0001	<.0001	0.0009	<.0001
Frequency of use	0.0176	<.0001	<.0001	0.0003	<.0001
Administrative function use	0.0214	0.0009	0.0003	<.0001	0.0001
Usability	0.0199	<.0001	<.0001	0.0001	<.0001

If a p-value is smaller than 0.05, the relationship between the two variables is statistically significant, such as in this case. This means that the relationship between usability of *my*Unisa and facilitating knowledge acquisition in ODL is statistically significant.

Figure 7.3 is a correlation matrix depicting the relationship of the constructs being investigated.

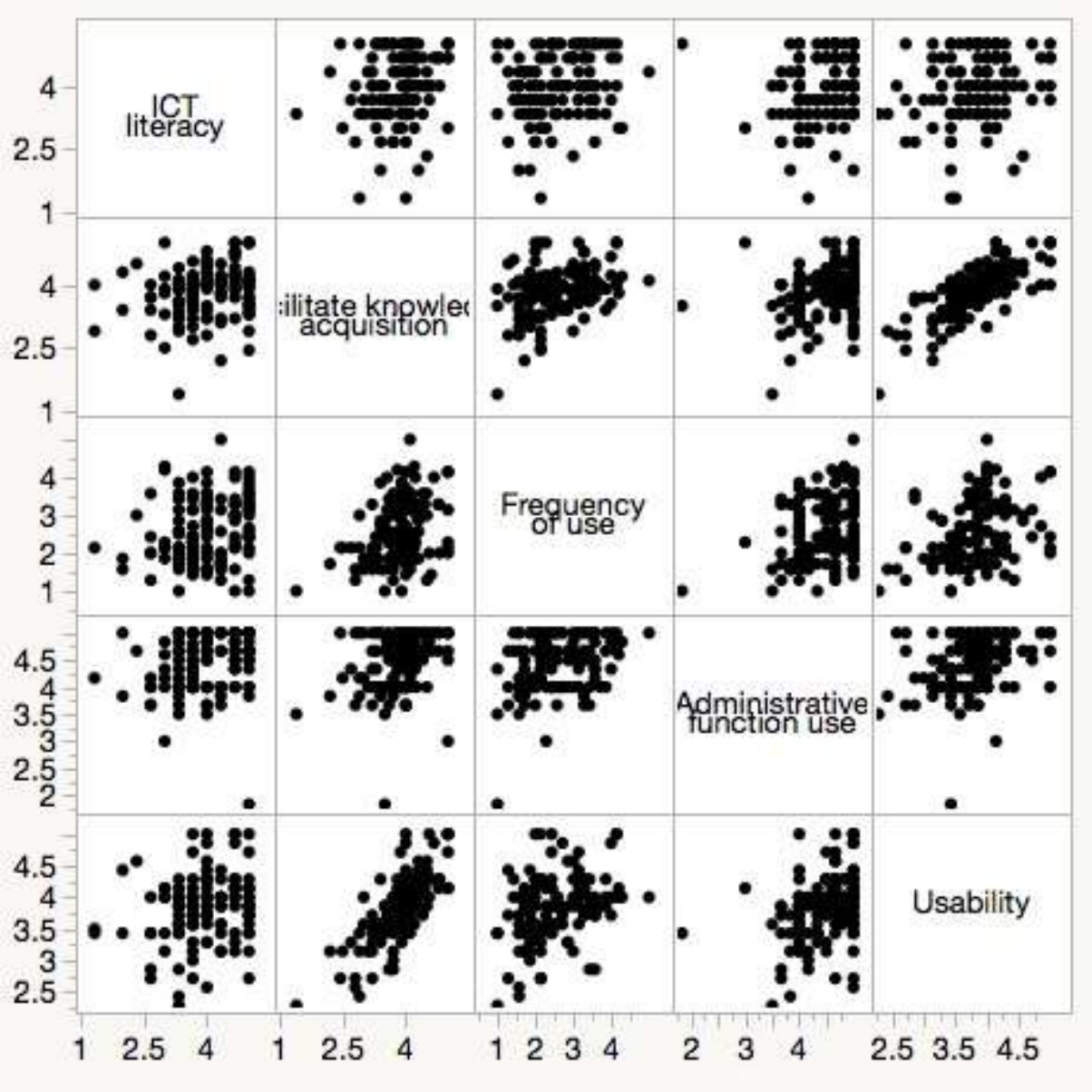

Figure 7.3: Correlation matrix

There are two pronounced visual patterns on the correlation matrix. These are the intersection of the second row and fifth column, and the intersection of the fifth row and the second column. The plotted points are in a loose linear form in both cases suggesting the presence of a relationship. These two quadrants represent a relationship between “facilitating knowledge acquisition” and “usability of *my*Unisa”, with facilitating knowledge acquisition as the independent variable, and usability of *my*Unisa as the dependent variable. This is further supported by a positive p-value ($p<0.05$) for statistical significance. More research will be required in order to confirm this relationship. The scatter diagrams in the other quadrants do not exhibit any noteworthy relationship.

7.5.5 ANALYSIS OF RESEARCH RESULTS

This section analyses and discusses the research findings, which were presented in the preceding section. The findings of a qualitative analysis compares favourably with those of a quantitative analysis, the only difference is that numerical values (in the form of numbers and percentages) can be assigned to each variable in the quantitative analysis. This positive comparison has an effect of validating the two approaches. The survey instrument is divided into six constructs and will be discussed separately. Each construct was designed to address particular aspects of relevant research question(s).

7.5.5.1 Access to ICT infrastructure

Access to ICT infrastructure is measured by access to a computer that connects to the *my*Unisa learning platform. Research indicates that easily accessible students' services are one of the most important components of a successful learning programme. An e-learning operation requires investment in technology solutions and skilled support personnel to run them (University of KwaZulu Natal, 2009). Access to infrastructure is also key to connectivity in an e-learning environment. Connectivity requires internet availability. But in Africa, internet access varies from country to country. For instance, in June 2016 South Sudan had 2,180,000 internet users out of a population of 12,500,000 people, while in South Africa for the same period, had 28,580,000 internet users out of a population of 54,300,000 people (Ischebeck 2017). The Broadband Commission (2014) also reported that eight of the ten countries with low levels of internet availability in the world are in sub-Saharan Africa.

The majority of respondents were satisfied with their access to the internet (at 93%). However, in a pure ODL environment, where there is no face-to-face contact, the ideal measurement would be 100%. Since it is practically difficult to attain such a high level of access accompanied with affordability, any high percentage is to be appreciated. The other two statements on ICT infrastructure were connectivity challenges and disruptions due to power failures. These two items impede the learning process in an ODL setting. Connectivity needs to be absolute and power failures need to be non-existent (again in a perfect world). The effects of connectivity and power failures need to be minimised in order to improve the learning experience. More work will be required in order to eliminate these challenges. Some of the research questions that can be addressed by this section are:

- How can web-based learning become a paradigm shift?
- How proficient are the students in the use of the relevant hardware and software?

Arguably, web-based learning can only happen if there is the necessary infrastructure; students become proficient if they can connect their computers to the *my*Unisa LMS.

7.5.5.2 ICT literacy

Three statements were available to assess the level of computer literacy, namely exposure to internet and e-learning and access to *my*Unisa. A majority of the respondents agreed that they had prior exposure to the internet and could access the *my*Unisa platform. However, many respondents had no prior exposure to an e-learning environment. But the respondents need to be educated that *my*Unisa is in fact an e-learning platform, therefore, when one accesses the *my*Unisa platform, they were actually engaging in e-learning. It is perhaps a question of awareness more than anything else. Therefore, after a respondent has access to ICT infrastructure, s/he needs to acquire a satisfactory level of ICT literacy. Wanyembi (2011) did a survey in Kenya which established that there was low ICT and e-learning skills among academics at universities. Makokha and Mutisya (2016) also found that the utilisation of ICTs in the education sector for teaching and learning was not yet popular.

7.5.5.3 Usability of myUnisa

The *my*Unisa platform is a LMS driven by Sakai; it has been operating as a LMS for more than ten years now. The usability of *my*Unisa is synonymous with the usability of a LMS. It is in this context that *my*Unisa is being evaluated. The majority of respondents were satisfied with the usability of *my*Unisa. The main areas of disagreement were two statements on Management Accounting and the statement about “learning more with *my*Unisa than without”.

In a study conducted by Saito et al (2010), it was found that PriceWaterhouse and Coopers (PWC) offices expected to deliver their core competences in accounting through a low-cost, efficient and flexible e-learning method. The results also suggested that e-learning was a dominant learning method adopted by the two international accounting offices, especially given the cost consideration (Herdan et al 2017). A careful design of the Management Accounting e-content should improve the present status quo. Herdan et al (2017) further suggests that accounting students should be

given the opportunity to experience various aspects of technologies as this would prepare them better for the workplace.

It is clear from these results that more work is required in order to bring Management Accounting to a higher level of satisfaction. Respondents were not happy with the layout of the content of Management Accounting as well as the manner they could engage with other students. More research will be required in order to change the negative perceptions in the subject. Some respondents disagreed that they could learn more with *my*Unisa than without. It is not clear why there was this disagreement. Maybe it is just a matter of resisting change that is biased towards technology.

7.5.5.4 Use of ICTs in facilitating ODL

Unisa is an institution that is in the open distance space. Traditionally, students would register using the snail (traditional) mail, receive their study material via snail mail, get exam results using the snail mail; everything was very slow especially when compared to electronic (email) transmission. The use of ICTs in facilitating ODL has transformed how distance learning happens, in terms of speed and even opportunities for interaction among students.

A majority of respondents were satisfied with the use of ICTs in facilitating ODL. This is consistent with the findings on ICT infrastructure, ICT literacy and usability of the *my*Unisa platform (Isabirye & Dlodlo 2014). Open distance learning can be quite demanding with regard to student engagement. According to Grabinski et al (2015), e-learning component requires from students self-reliance, good time management, persistent engagement, and systematic communication with lecturer. E-learning also provides students with access to flexible learning procedures with no time and location restrictions (Grabinski et al 2015). All these facets systematically interact in order to facilitate an enabling educational environment.

There were some disagreements though, on Management Accounting and the use of additional resources on *my*Unisa. The way that the content of Management Accounting is presented needs relooking as previously alluded to. The additional resources section can also be restructured in order to improve the learning experience.

The discussion in this section (Section 7.5.5) provides answers to questions **RQ-1, RQ-2, RQ-3 and RQ-4** in Chapter 1 Section 1.3.

7.5.5.5 Use of administrative functions

Respondents agreed that they used the administrative functions; in some cases, the level of agreement was as high as 98%. This is an ideal level of satisfaction and awareness. It is indicative of the fact that respondents are at least aware of these features even if they do not use them all the time. As indicated earlier, these features are electronic in nature, which means they are very fast, and they are economical, affordable and convenient.

Another possible explanation for the high level of satisfaction and engagement was a deliberate policy by Unisa requiring all registrations to be done online (van Schoor 2013). This has the effect of exposing every prospective student to the technological feature(s). The exposure to a feature becomes a basis of further experiential learning in the modern "Teaching and Learning Village". The teaching and learning village in the KACF is equivalent to a learning community. Research has shown that a learning community can enhance learning support, information exchange, group commitment, collaboration, and learning satisfaction (Wang & Lui 2009).

7.5.5.6 Frequency of use

The majority of respondents were dissatisfied with the statements in this section except for the one on feedback. The other statements were on using quizzes, blogs, vodcasts and podcasts on *my*Unisa. These features appeared to be foreign to most respondents. There is need for the institution to embark on a programme that would raise the level of awareness on the features.

Use of hyperlinks and forums were also not satisfactory in this section but elsewhere in this analysis, were rated highly. Maybe, the lower rating is the more realistic one.

7.5.6 Quantitative and qualitative comparisons

The use of quantitative and qualitative approaches in combination provides a better understanding of research problems than either approach alone (Onwuegbuzie & Johnson 2004). This section discusses some questions, which appear both in the interview section and on the survey instrument. The results of the survey instrument were statistical, being measured as percentages or other numerical values. On the other hand, the interview results were literary narratives of the perspectives held by the teaching staff. Approaching the same aspect from different angles afforded the

researcher breadth and depth to the research question and its answers. Moreover, Creswell (2014) suggests that the quantitative analysis provides a general understanding of the research problem, whereas qualitative analysis refines and explains the statistical results in more depth.

Responses from the online questionnaire revealed that the majority of respondents were not satisfied with the statements on Management Accounting education. The two statements stated:

- For Management Accounting, the activities on *my*Unisa generally encourage me to engage with other students.

  Responses: Disagree – 18%, Neutral – 37%, Agree – 44%.

- The way in which Management Accounting is set up on *my*Unisa encourages me to learn independently.

  Responses: Disagree – 14%, Neutral – 36%, Agree – 48%.

The percentage ratings by respondents are very similar in both cases. The consistent metrics in the two statements tend to validate the assertion about Management Accounting. Quantitatively, it is clear how respondents perceive Management Accounting education as it is delivered through the *my*Unisa platform. Why did the respondents give these ratings? An explanation may be found in the responses to a similar interview question:

- How can we facilitate Management Accounting education so that students learn by doing?

  Responses:

  - This can be achieved if there is more active participation by students through assignments, group work, or other activities.
  - Students have always been learning by doing; in the examples, assignments, or tests.
  - Students would need more face-to-face contact, alternatively, through real-time guidance using technology.
  - Management accounting education already incorporates the learning for students by doing e.g. assignments and tests.

There were some questions in the interview part, which were similar to some statements on the survey instrument. One of them was:

- Are there mechanisms for preparing both students and academic staff to use the available technology effectively enough?

  Firstly, the online survey was directed at the students. The assessments were in regard to ICT infrastructure, ICT literacy, usability on *my*Unisa, use of ICTs in facilitating ODL, administrative functions and the frequency of use by the respondents. The quantifications on each of the mentioned items was given, some were good, and some were not so good. The metrics can be clearly understood. An explanation to these metrics can be found in the responses to the interview question:

  Responses:

  - Yes, there are, through messages (email & SMS) and comprehensive instructions.
  - Yes, there are. Students get detailed support, for instance, through step-by-step instructions on how to carry out tasks.
  - Yes, there are; students have access to the technology so that they can learn by experience.
  - I believe for lecturers yes, but not for students as they are all over the world.

Another statement, which appeared both on the interview questions and on the survey instrument is the following:

- How proficient are the students in the use of the relevant computing technology?

  One can use two sections on the online survey in an effort to answer this question, namely the administrative functions and the frequency of use. On the administrative functions, the answer would be “Students are very proficient.” Because all the percentage ratings were around 90%. However, the technological preferences would have a negative response, that is: “Students are not proficient in the use of these technologies.” The ratings are mostly below 50%. The online survey affords us a capacity to quantify the variables at play.

The quantifications can be explained by the responses to the interview questions:

Response:

- Progress is about half-way at present… they should be more proactive than reactive.
- Differs from student to student and depends on the availability of computer internet access.
- Those with proper access are very proficient, and those without exposure have limited efficiency.
- Some are proficient; others are not because they don't have access to technology.

The above responses, especially in the last section, summarises the solutions proposed by the KACF, since the primary objective of a framework is to organise and present in a friendly manner, complex issues such as e-learning.

7.6 SUMMARY

This chapter presented and analysed data from the interview sessions as well as data from the survey instrument. The quantitative analysis enabled the researcher to quantify some parameters and constructs which were being studied on the *my*Unisa platform. On the other hand, the qualitative analysis added more understanding and meaning to the narratives of the parameters. This mixed methods approach seemed to be the best strategy for this particular analysis as it combined the good aspects from each approach. Issues of validity and reliability were addressed. For instance, the online questionnaire was reviewed by the statistician so as to ensure the validity and reliability of the constructs. Cronbach's Alpha was used to measure the reliability of constructs. The measures of reliability as measured by Cronbach's Alpha ranged from 0,6094 to 0,8146, and were all acceptable in this research.

The next chapter gives the conclusion, recommendations and suggestions for future work.

CHAPTER EIGHT: CONCLUSION, RECOMMENDATIONS AND FUTURE WORK

8.1 INTRODUCTION

This study sought to explore how Unisa students (in Management Accounting) perceive and experience online learning. Two instruments were employed to gather the necessary information that would enable the researcher to answer the research questions; namely, the interview questions to the four lecturers of Management Accounting and the online questionnaire to registered second year students of the same subject. The two approaches seemed to be the best strategy to answer the research questions posed and themes emanating from the literature review. The themes that emerged were also the building blocks of the KACF, which had been designed to address implementation challenges.

The mixed-methods approach combined the good qualities from each strategy, therefore, coming up with a better outcome as it brought in elements of triangulation. A basic feature of triangulation is the combination of two or more different research strategies in the study of the same empirical variables (Blaxter, Hughes & Tight 2010). Triangulation also corroborated the results from different methods further increasing the validity of constructs and results. The two methods complemented each other by taking into account results from one method with results from the other method, which again increased the meaningfulness and validity of the constructs (Onwuegbuzie & Johnson 2004). The research procedures followed, therefore, enabled the researcher to gain a deeper insight of the research questions further enhancing the validity and reliability of the research. The data analysis of the quantitative and qualitative data in most cases confirmed results of some studies revealed in the literature (Schneider & Stern 2010). The research findings are specific to the particular cohort of Unisa students for the academic year 2015/16, and may not be generalised to other groups beyond this one.

Several authors (Laurillard 2002; Guri-Rozenblit 2009; Moore et al 2011; Rudestam & Schoenholtz-Read 2010; van Rooyen 2015) reveal that developments in e-learning are inadequately employed in knowledge acquisition and creation in Management Accounting education for students in an ODL environment. Ssekakubo et al (2011) did some work related to the challenges of e-learning implementations and revealed that

a number of studies had been carried out in other developed and developing countries. A majority of the e-learning implementations tend to fail in part or totally due to a variety of reasons (Ssekakubo et al 2011). The most cited reason is an absence or inadequacy of infrastructure.

The researcher constructed a framework, which was aimed at addressing some of these barriers and challenges. A framework, in essence, is a tool that is designed to organise and manage a complex subject like e-learning or Management Accounting. The design of the framework was informed by work done by Guri-Rozenblit (2009) and Moore et al (2011) among many others. Most of the mechanisms embedded in the framework are aimed at facilitating the learning process for students, and in assisting them to make use of the available technologies. For instance, the framework identified a lack of human support, and provided a solution by assisting lecturers to acquire ICT skills at the implementation stage. The framework also suggests remedies for inappropriate use of the technologies, poor infrastructure and a lack of access to ICT infrastructure as well as introducing a teaching and learning village to benefit communities.

8.2 RECOMMENDATIONS

From the work done by Guri-Rozenblit (2009), Moore et al (2011) and Grabinski et al (2015), and other challenges discussed as well as results from the online survey, the following recommendations are suggested. The recommendations are in two parts: the first part addresses the constructs of ICT infrastructure, ICT literacy, usability of *my*Unisa, facilitating ODL knowledge acquisition, the use of administrative functions and frequency of use, in general, while the second part focuses on problematic areas as highlighted by the outcome of the survey instrument and interview questions.

Furthermore, the recommendations address the following areas: ICT infrastructure, ICT literacy, and usability of *my*Unisa, use of ICTs in facilitating ODL, use of administrative functions and the technological preferences of respondents:

- Since ICT infrastructure is key to the successful implementation of any e-learning project, there is need to expand e-learning infrastructure in order to facilitate access to e-learning for the students, faculty and other interested parties. Tarus et al (2015), however, confirm that some progress has been

made in improving the ICT and e-learning infrastructure at public universities in Kenya.

- Provide computers, laptops, networks and other relevant infrastructure that will improve access to e-learning.
- There is need for Internet bandwidth subsidy in order to make the cost affordable. Adequate Internet bandwidth will ensure faster Internet connectivity, hence facilitating quicker and easier access to e-learning resources.
- Formulate operational policies (e.g. online registration, e-tutor project) which will demand student engagement.
- Introduce compulsory ICT and e-learning courses for all first year students in order to raise the level of ICT awareness.
- Make it compulsory for each student to have a laptop that connects to the Internet in order to improve access to e-learning resources.
- Create free hotspots, which will allow students to connect to the Internet and myUnisa.
- The institution should negotiate with computer manufacturers for cheaper ways of acquiring computers and laptops by students.

8.2.1 ICT infrastructure

It must be pointed out that Internet access does not necessarily translate to accessing the *my*Unisa platform. The Broadband Commission (2014) also reported that eight of the ten countries with low levels of Internet availability in the world are in sub-Saharan Africa. In 2011, the World Bank (2016) further reported that 6% of the world's Internet users were in Africa. The quantitative survey indicates that 93% of the respondents had access to a computer while 72% of the respondents had access to the internet. In this section, the causes of connectivity challenges and the power failures need to be established before formulating strategies to rectify them. The connectivity challenges were confirmed by 73% of the respondents while the power failures were reported by 44% of the respondents. The resolution might be at government or institution level as it might involve substantial funding requirements. It is important to know why there is a connectivity problem, is it being caused by a power failure? Or is the network faulty? And how can it be avoided?

8.2.2 ICT literacy

The results of the online survey indicate that many respondents did not have prior exposure to e-learning (43%), however, the number of respondents who had both Internet access and access to *my*Unisa platform were quite high at 91%. It has already been suggested that a compulsory e-learning module be introduced to all first year students in order to raise the level of awareness for the exposure to e-learning. The items, which were found satisfactory by the respondents, can be sustained at those high levels. A study by Tarus et al (2015) revealed that a lack of the relevant technical skills on e-learning and e-content development by the teaching staff is a challenge hindering implementation of e-learning in public universities. Wanyembi (2011) established in a survey done in Kenya that most of the academics in universities have low ICT and e-learning skills because most of them were trained before the ICT environment.

8.2.3 Usability of *my*Unisa

The results of the online survey on the usability of *my*Unisa indicate that many respondents were not satisfied with the Management Accounting content. There is a need to restructure this content so that it appeals to e-learning students. The other metrics were quite high confirming agreement with the statements. These metrics confirm that a large number of respondents were satisfied with the usability options on *my*Unisa. A usability study was done on the *my*Unisa Assignment Submission Tool website (Pretorius 2008). The usability test showed that respondents were generally satisfied with the usability of *my*Unisa. It is however suggested that *my*Unisa can be improved by including relevant instructions for each task, clear error messages and use of consistent words and terms (Pretorius 2008).

The dissatisfaction with Management Accounting is registered in more than one area in these findings. The quantitative findings also reveal a strong relationship (0.7573) between usability of *my*Unisa and facilitating ODL knowledge acquisition. This suggests that the more one uses *my*Unisa, the more one acquires knowledge in an ODL setting. This finding is significant since it would impact positively on the e-learning experience. The p-value ($p<0.05$) is further testimony that this relationship is statistically significant.

8.2.4 Use of ICTs in facilitating ODL

Management Accounting is mentioned again in this section as having a poor layout. The comments on Management Accounting earlier are relevant again in this section. The additional resources are assumed to be in Management Accounting since that is where this research is focusing. Therefore, as the Management Accounting content is being restructured, so will the additional resources section also.

The ODeL model is gaining popularity owing to its often cited, study anyhow, anywhere and anytime characteristic (Pastor et al 2010; Simpson 2012). Despite the many advantages brought about by ODeL, it often faces demanding challenges owing to its inherent distance - education component. Some concepts, especially those having a mathematical content, are hard to convey adequately to students over a distance (van der Poll & Dongmo 2012). Grabinski et al (2015) suggest that there are some accounting modules where e-learning delivery is not possible and would require some additional face-to-face contact with the lecturer.

8.2.5 Use of the administrative functions

This was the best rated section in the instrument. Most of the metrics on the number of respondents who agreed were above 96% and 98%. It is reported by Bagarukayo and Kalema (2015) that most students used the *my*Unisa platform for administrative purposes. Respondents were generally aware of the administrative functions on *my*Unisa. There is need to maintain this high level of awareness.

8.2.6 The technological preferences of respondents

On the other hand, this section was the most unpopular with the respondents judging by the low number of respondents who agreed with the statements. It is suggested that these statements be included in a compulsory ICT awareness course to be offered to all first year students. Once this is done, the ICT literacy of all registered students can be taken for granted.

Some of the responses from the lecturers are repeated here in an effort to sum up the qualitative findings. The lecturers held the following views about their students:

- Students need to be aware of the technology; be able to access the technology and know how to use the technology effectively.

- Students generally do not use the technology.
- Students need to have easy and affordable access to the online environment.
- Student feedback is important, more student participation is necessary for the success of this technology.
- In reality, online tutorials have not yet taken off (only 20 out of a 1,000 students do participate).

When asked on how proficient the students were in using the relevant computing technology, these were the lecturers' responses:

- Progress is about halfway at present ,… they should be more proactive than reactive.
- Differs from student to student and depends on availability of computer internet access.
- Those with proper access are very proficient, and those without exposure have limited efficiency.
- Some are proficient, others are not because they don't have access to technology.

When lecturers were asked how they could be better prepared for e-learning, their responses were as follows:

- Instructors need relevant training and support on e-skills.
- Instructors can improve through the frequent use of the technology.
- By attending training on what is available, know and be able to use the available technology.

Lecturers commented about mobile technologies and shared their views about how online learning could be improved:

- Students need to have easy and affordable access to the online environment.
- There is need to increase capacity in terms of human resources, and bandwidth.
- Ensure that sufficient data capacity is available to handle the number of students simultaneously.

- The use of cell phones, SMS, emails, internet and myUnisa platform have vastly improved interactions (student-to-student, student-to-lecturer, student-to-content).
- Mobiles can be used to SMS relevant communication, to access online content and to address interactivity e.g. through "WhatsApp."
- Provides learning material "in the palm of their hands."

The above remarks by the lecturers sum up the challenges that face most e-learning implementations. The next section is the summary followed by highlights of some work, which may need to be done in future.

8.2.7 Summary

One of the assumptions (in section 1.8) mentioned that all participants would have access to a computer and Internet; and also that there would be no power disruptions due to power failures. But the quantitative results indicated that access to computers and internet was around 93% while power failures stood at 44%. Furthermore, it has been indicated (in section 8.2.1) that generally some countries in Africa experienced poor Internet access; sometimes due to unavailability of electricity. This is the reality. These discrepancies presented the researcher with inconsistencies on the data which tended to compromise issues of validity and reliability as regards access to infrastructure and issues on connectivity.

The theories of constructivism (section 2.12), cognitivism (section 2.11) and behaviourism (section 2.10.1), which happen to be the cornerstone of the framework, are again the key theories that can enhance the creation of knowledge in Management Accounting. It is argued in this research that learning technologies, like LMSs, can be deployed to support that type of pedagogy. The discussions in this thesis seem to support this viewpoint, and one can say there is some validation of both RQ1 and RQ2.

RQ3 does not seem to have been validated judging from the survey responses, which rated Management Accounting issues poorly, some lecturers were also not very happy with the performance of their students in Management Accounting according to the interview results.

The responses from the interviews coupled with evidence coming from the online survey seem to confirm that some measures were taken to prepare both students and

academic staff to use available technologies effectively. However, contradictions from the assumptions referred to above, need to be managed well. This suggests that some aspects of RQ4 cannot be validated 100%. The remaining questions and objectives in section 1.3 and 1.4 were incorporated into the online questionnaire and the interview questions.

8.3 FUTURE WORK

Many studies have been conducted in the area of online education, some of which have been in the accounting discipline. Initial findings indicate that technology may be useful in administering and managing learning.

Faculty and students should be assisted with technology training so that the teaching and learning processes can be improved. Most students prefer a moderate amount of technology use in their courses in combination with face-to-face contact which was confirmed in the interviews that the researcher conducted with the lecturers.

Future work should cover the following areas:

- A longitudinal study from year 1 to year 4 for a cohort of students, and study their changing perceptions to online learning.
- Investigate why online participation seems to be so low at about four percent.
- Garrison and Vaughan (2008) and Haythornthwaite and Andrews (2011) emphasise how interaction is important if meaningful learning is to take place. Online learning should invest in quality interaction, both student-faculty and student-student interaction.
- Recent research seems to support preference for face-to-face contact. There is need for research on how to reconcile this need.
- Use the framework to test some pedagogical designs in e-learning possibly contributing towards the utility of the designs.
- The framework can be used as a tool for further research in online Management Accounting education. A detailed study into how Management Accounting education can best be taught over a distance.
- Replication of this study at other institutions of higher learning which offer distance learning as a delivery mode.

REFERENCES

AAA. (1985) Committee on Integrating the Computer into the Managerial/Cost Curriculum, Integrating the Computer into the Managerial/Cost Curriculum: A Resource Manual. Sarasota.3

Alves, E. 2016. Principles of Management Accounting MAC2601, pp1-19.

Alves, P., Miranda, L., Morais, C. & Alves, E. 2012. Proposal of a learning Styles Identification Tool for Sakai Virtual Learning Environment. *Computer Science & Engineering*. Special Issue: 47-54.

Ambient Insight Research (2009) US Self-paced e-Learning Market Monroe WA: Ambient Insight Research. Available from: http://www.ambientinsight.com/Reports/eLearning.aspx [Accessed 23 March 2016].

Anderson, J.E. 1979. A Theoretical Foundation for the Gravity Equation, *American Economic Review*, 69(1): 106-116.

Anderson, T. 2008. *The Theory and Practice of Online Learning*, Edmonton: AU Press.

Anderson, T. and Garrison, D.R. 1998. Learning in a networked world: New roles and responsibilities, *Distance learners in higher education* C. Gibson (Ed.), Madison. WI: Atwood, 1998, 97-112.

Anderson, T., Rourke, L., Garrison, D., and Archer, W. 2001. Assessing teaching presence in a computer conferencing context. *Journal of Asynchronous Learning*, 5: 1–17.

Ashworth, F., Brennan, G., Egan, K., Hamilton, R. and Saenz, O. 2008. Learning Theories and Higher Education, Arrow@DIT - Dublin Institute of Technology, pp. 0–16. Available from: http://arrow.dit.ie/engscheleart/4/ [Accessed 24 June 2016].

Assegaff, S. and Hussin, A.B. 2012. *Review of Knowledge Management Systems as socio-Technical system.* Faculty of Computer Science and Information Systems. Universiti Tecknologi Malysia. Skudai; Johor, Malysia.

Babbie, E. 2013. *The basics of social research*. Belmont CA: Wadsworth Thomson Learning.

Bagarukayo, E. and Kalema, B. 2015. Evaluation of e-learning Usage in South African Universities: A Critical Review. *International Journal of Education and Development using ICT,* 11(2): 168-183.

Bagarukayo, E., Weide, T.P., Mbarika, V.W., and Kim, M.S. 2012. The impact of learning driven constructs on the perceived Higher Order Cognitive Skills Improvement. Multimedia vs Text. *International Journal of Education and Development using ICT.* 8: 120-130.

Baran, P. 1964. *Introduction to distributed communications networks*, RAND memoranda RM-3420-PR, RAND Distribution Services, Santa Monica, CA.

Bates, A.W. 2005. *Technology, e-learning and distance education*, London: Routledge.

Beckman, K., Bennett, S., and Lockyer, L. 2014. Understanding students use and value of technology for learning, *Learning Media and Technology,* 39, 346-367. Available from: https://doi.org/10.1080/17439884.2013.878353, [Accessed 23 March 2017].

Berger, H., Eylon, B.S., and Bagno, E. 2008. Professional Development of Physics Teachers in an Evidence-Based Blended Learning Program. *Journal of Science Education and Technology,* 4(17): 399-409.

Bergman, M. 2008. *Advances in Mixed Methods Research*. London: SAGE Publications Ltd.

Berhanu, B. 2010. *A model for an e-portfolio-based reflective feedback case study of e-learning in developing countries.* University of Hamburg. Hamburg.

Blaxter, L., Hughes, C. and Tight, M. 2010. *How to research*. Maidenhead : Open University Press/McGraw-Hill Education.

Boer, G.B. 2000. Management Accounting Education: Yesterday, today and tomorrow. *Issues in Accounting Education*. 15(2): 313-314.

Brace, I. 2008. *Questionnaire Design: How to plan, structure and write survey material for effective Market Research*. 2nd Edition. London: Kogan Page Publishers.

Bray, R.J.C. and Els, G. 2007. Unpacking 'ethno – finance': An introduction to indigenous 'finance' knowledge systems. *South African Journal of Information Management.* 9(1):1-10.

Brewer, P.C. (2008). Redefining management accounting. *Strategic Finance*, 89(9): 27-34.

Bri, D., García, M., Coll, H. and Lloret, J. 2009. A Study of Virtual Learning Environments, *WSEAS Transactions on Advances in Engineering Education*, 1(6), 33-43. Available from: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.522.2279&rep=rep1&type=pdf (Accessed: 24 June 2016).

Broadband Commission. 2014. The State of Broadband 2014: Broadband for all. United Nations Educational, Scientific and Cultural Organization. Available from: http://broadbandcommission.org/documents/reports/bb-annualreport2014.pdf, [Accessed 27 March 2016].

Bronwyn, E.M. 2000. Scaffolding: A suitable teaching characteristic in one-to-one teaching in maths recovery. *Queensland University of Technology. Proceedings Mathematics Education beyond 2000.pp 417 – 423, Fremantle, Western Australia.*

Bruner, J. 1985. Models of the Learner. *Educational Researcher.* 14(6): 5-8.

Burke, J. 1998. The internet highway: a new learning tool for accounting students, *New Accountant*, 14(1).

Calvert, V., Kurji, R. and Kurji, S. 2010. Service Learning for accounting students: What's the faculty role? *Research in Higher Education Journal,* 17(1): 1-11.

Canterbury Christ Church University 2006. *An Introduction to Ethics Issues and Principles in Research Involving Human Participants*. Canterbury: CCCU.

Carabajal, K., LaPointe, D., and Gunwardena, C.N. 2003. Group Development in Online Learning Communities. In: Moore, M.G. and Anderson, W.G. (Eds.) *Handbook of Distance Education* (pp. 217-234). Mahwah New Jersey: Lawrence Erlbaum Associates.

Carlile, O. and Jordan, A. 2005. It Works in Practice but will it Work in Theory? The Theoretical Underpinnings of Pedagogy, Emerging Issues in the Practice of University Learning and Teaching, G. O'Neill et al (eds.), Dublin, All Ireland Society for Higher

Education (AISHE). Available from: http://www.aishe.org/readings/2005-1/collection.pdf [Accessed 27 March 2017].

Carlile, O., Jordan, A. and Stack, A. 2008. *Approaches to learning: A guide for teachers: A guide for educators*. McGraw Hill Education (UK).

Carter, L. M., Salyers, V., Myers, S., Hipfner, C., Hoffart, C., MacLean, C., White, K., Matus, T., Forssman, V., & Barrett, P. (2014). Qualitative Insights from a Canadian Multi-institutional Research Study: In Search of Meaningful E-learning. *The Canadian Journal for the Scholarship of Teaching and Learnin*g, 5(1). http://dx.doi.org/10.5206/cjsotl-rcacea.2014.1.10

Caruth, G.D. 2013. Demystifying Mixed Methods Research Design. *Mevlana International Journal of Education.* 3(2): 112-122.

Cavana, M.L.P. 2009. Closing the circle: From Dewey to Web 2.0. In: Payne C.R. (ed). *Information technology and constructivism in Higher Education.* London: Information Science Reference.

Champ, H. 1997. Whistle while you work, *Accountancy Age*, 26: 14-15.

Chandra, A., Cheh, J. and Kim, W. 2006. Do we teach enough IT skills in Management Accounting Courses? *Management Accounting Quarterly*, 8(1): 49-54.

Clarck, R.E. 1983. Reconsidering Research on Learning from Media. *Review of Educational Research,* 53(4): 445-460.

Cohen, L., Manion, L. and Morrison, P. 2007. *Research Methods in Education*. 5th Ed. London: Routledge.

Cramer, J. 1996. *Experiences with implementing integrated chain management in Dutch Industry.* New Jersey: John Wiley and Sons.

Creswell J.W. 2014. *Research Design: Qualitative, quantitative and mixed methods approaches*. London: Sage.

Dahlstrom, E. and Bichsel, J. 2016. Study of Undergraduate Students and Information Technology, Available from: https://library.educause.edu/~/media/files/library/2016/10/ers1406.pdf (Accessed: 24 June 2016).

Dahlstrom, E., Brooks, D.C. and Bichsel, J. 2014. *The current ecosystem of Learning Management Systems in Higher Education*: Student, Faculty, and IT perspectives. Educause.

De Gagne, J.C and Walters, K. Online Teaching Experience: A Qualitative Metasynthesis (QMS), *MERLOT Journal of Online Learning and Teaching,* 5(4), Available from: http://jolt.merlot.org/vol5no4/degagne_1209.htm [Accessed 25 May 2017].

De la Harpe, B. and Peterson, F. 2009. The theory and practice of teaching with technology in today's colleges and universities. In: Payne C.R. (ed.). *Information Technology and Constructivism in Higher Education*. London: Information Science Reference.

Denzin, N.K. and Lincoln, Y.S. 2012. *The Landscape of Qualitative Research.* California: Thousand Oaks. EDUCAUSE. Centre for Analysis and Research. Available at: http://www.educause.edu/ecar

Dosch, J. 2010. Teaching Management Accounting online. *Cost Management*, 24(2): 44-48.

DuVall, J.B., Powell, M.R., Hodge, E. and Ellis, M. 2007. Text messaging to improve social presence in online learning. *Educause Quarterly*, 30(3): 24.

University of KwaZulu Natal. 2009. E-Learning Implementation Plan. Available from: http://elearn.uzulu.ac.za/docs/e-Learning%20implementation%20strategy%20and%20plan%20of%20Unizulu.pdf, [Accessed 23 March 2017].

Fakhreldeen, A.S. 2013. Comparing and Evaluating Open Source E-Learning Platforms. *Internal Journal of Soft Computing & Engineering (IJSCE),* 3(3): 244-249.

Fernández-Manjón, B., Sánchez-Pérez, J.M., Gómez-Pulido, J.A., Vega-Rodríguez, M.A., and Bravo-Rodríguez, J. 2007. *Computers and Education. E-learning, From Theory to Practice.* Springer: Dordrecht.

Field, A. 2009. *Discovering Statistics using SPSS.* 3rd Edition. Sage. Los Angeles.

Fu, L.M. and Buchanan, B.G. (1993). Learning Intermediate Concepts in Constructing a Hierarchical Knowledge base, International Joint Conferences on Artificial Intelligence, Los Angeles, California, USA Available from:

http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.99.4334&rep=rep1&type=pdf [Accessed 25 May 2017].

Garrison, D.R. 2003. Cognitive presence for effective asynchronous online learning: The role of reflective inquiry, self-direction and metacognition. In J & JC (Eds). *Elements of quality online education: Practice and direction* pp47-58. Needham, MA: Sloan C.

Garrison, D.R., Anderson, T., and Archer, W. 2001. Critical thinking, cognitive presence, and computer conferencing in distance education. *American Journal of Distance Education*, 15(1): 7-23.

Garrison, D.R. and Cleveland-Innes, M. 2005. Facilitating Cognitive Presence in Online Learning: Interaction is not enough. *The American Journal of Distance Education*, 19(3): 133-148.

Garrison, R. and Vaughan, H. 2008. *Blended learning in Higher Education: Framework, principles and guidelines*. San Francisco: Jossey-Bass.

Gilbert, J., Morton, S. and Rowley, J. 2007. e-Learning: The student experience, *British Journal of Educational Technology*, 38(4): 560–573. Available from: http://onlinelibrary.wiley.com/doi/10.1111/j.1467-8535.2007.00723.x/full (Accessed: 11 May 2016).

Goldin, C., and Katz, L.F, 2009. *The race between education and technology.* Cambridge: Belknap Press.

Goodfellow, R. and Lea, M.R. 2007. *Challenging E-learning in the University*. McGraw Hill: New York.

Grabinski, K. Kedzior, M. and Krasodomska, J. 2015. Blended learning in tertiary accounting education in the CEE region: A Polish perspective. *Accounting and Management. Information Systems* 14(2): 378-397.

Grant, K. and Pennypacker, J. 2006. Project management maturity: An assessment of project management capabilities among and between selected industries, IEEE Transactions on engineering. Available from: http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=1580894 [Accessed 29 November 2016].

Guba, E.G. 1990. *The Paradigm Dialogue.* Los Angeles: Sage Publications.

Guri-Rozenblit, S. 2009. *Digital technologies in higher education : sweeping expectations and actual effects*. New York : Nova Science Publishers.

Harasim, L. Hiltz, Teles, L. and Turoff, M. 1995. *Learning networks: A field guide to teaching and learning online.* Cambridge: MIT Press.

Harding, A., Kaczynski, D. and Wood, L., 2005. Evaluation of blended learning: analysis of qualitative data. Uniserve Science Blended Learning Symposium Proceedings.

Haythornthwaite, C. and Andrews, R. 2011. *E-learning Theory and Practice*. Sage Publications, London.

Henning, E., Gravett, S, and van Rensburg, W. 2005. *Finding your way in qualitative research*. Van Schaik. Pretoria.

Herdan, A., Neri, L. and Russo, A. 2017. The perceptions of blended learning in an accounting module by MBA students (Unpublished). University of Greenwich.

Herselman, M.E. and Hay, H.R. 2003. An investigation into e-learning practices: Implications for providers of education and training, *South African Journal of Higher Education*, 19(2), 393-410.

Holmes, B. and Gardner, J. 2006. *E-Learning: Concepts and Practice,* London: Sage Publications

Howson, C. 2014. *Successful Business Intelligence. Unlock the Value of BI & Big Data*. McGraw Hill Education.

Huang, H. 2002. Toward constructivism for adult learners in online learning environments, *British Journal of Educational Technology,* 33(1): 27-37.

Humphrey, C. and Lee, B. 2004. The real life guide to accounting research: A strategy for inclusion. *Qualitative Research in Accounting and Management.* 1(1): 66-84.

Ischebeck, J. 2017. *Quick Guide: Improving Education with EdTech in Africa*. Available from: https://elearningindustry.com/improving-education-edtech-in-africa-guide, [Accessed 23 March 2017].

Kalogrides, D. and Loeb, S. 2013. Different Teachers different peers. The magnitude of students sorting within schools. *Educational Researcher,* 42(6): 304-316.

Kaniclides, T., and Kimble, C. 1994. *Executive Information Systems: A framework for their development and use*. University of York, Department of Computer Science (YCS), York, England.

Kashora, T., van der Poll, H.M. and van der Poll J.A. (2012) 'E-Learning Technologies for Open Distance Learning Knowledge Acquisition in Management Accounting'. *Conference held in Montreal, Canada. June 2012.*

Kashora, T., van der Poll, H.M. and van der Poll, J.A. 2013. Evaluation of an ODeL Knowledge Acquisition and Construction Framework, Joint International Conference on Engineering Education and', ICEE, pp. 360-368.

Kashora, T., van der Poll, J.A. and van der Poll, H.M. 2014. Evaluating the Utility of a Knowledge Acquisition and Construction Framework for Learning Management Systems, in Proceedings of the e-Skills for Knowledge Production and Innovation Conference 2014, pp. 161-172.

Kashora, T., van der Poll, H.M. and van der Poll, J.A. 2016. E-learning and technologies for open distance learning in Management Accounting, *Africa Education Review,* 13(1). Doi: 10.1080/18146627.2016.1186863.

Kolb, A.Y. and Kolb, D.A. 2008. Experiential Learning Theory: A Dynamic, Holistic Approach to Management Learning, Education and Development. Armstrong, S.J. and Fukami, C. (Eds) *Handbook of Management Learning, Education and Development.* London: Sage Publications 2008.

Koziol, L.F. Beljan, P. Bree, K. Mather J. and Barker, L. 2016. The normal distribution of the Bell-Shaped curve. Carge-Scale Brain Systems and Neuropsychological Testing. Pp 49-61.

Hadžić, F. 2014. Evaluation of E-Learning and LMS Usage at IBU. *Proceedings of the International Conference on Economic and Social Studies, Regional economic development, Sarajevo, April 24-25.* IBU Publications.

Isabirye, A.K. and Dlodlo, N. 2014. Perceived Inhibitors of Innovative E-Learning Teaching Practice at a South African University of Technology, *Mediterranean Journal of Social Sciences,* 5(4): 390-398.

Laurillard, D. 2002. *Rethinking University teaching: A framework for the effective use of learning technologies*. New York: Routledge.

Lebrun, M., Docq, F. and Smidts, D. 2009. Claroline, an Internet Teaching and Learning Platform to Foster Teachers' Professional Development and Improve Teaching Quality: First Approaches. *AACE Journal*, 17(4): 347-362.

Leedy, P.D. 2010. *Practical Research: Planning and Design*. New York: MacMillan.

Leiner, B.M., Cerf, V.G., Clark, D.D., Kahn, R.E., Kleinrock, L., Lynch, D.C., Postel, J. Roberts, L.G. and Wolff, S. 1997. Brief History of the Internet. Internet Society. Available from: https://internetsociety.org/internet/history-internet/brief-history-internet/, [Accessed 23 March 2016].

Lestor, S. 2010. An introduction to phenomenological research. Stan Lestor Developments, Available from: www.sld.demon.co.uk/resmethy.pdf. [Accessed 20 February, 2014].

Liebenberg, H., Chetty, Y. and Prinsloo, P. 2012. Student access to and skills in using Technology in an ODL context. *The First Unisa International ODL Conference, Pretoria, 5-7 September 2012,* Unisa Press.

Lin, P.C. & Smith, L.M. (2006). Using a web-based accounting system for teaching accounting system design and implementation. *Journal of Information Systems,* 20(2), 65-79.

Lister, M. 2014. Trends in the Design of E-Learning and Online Learning, *MERLOT Journal of Online Learning and Teaching,* 10(4): 671-680.

Loeb, S., Miller, L.C. and Strunk, K.O. 2008. *The State Role in Teacher Professional Development and Education throughout Teachers' Careers*. Stanford, Stanford University Press.

Love, N. and Fry, N. 2006. Accounting students' perceptions of a virtual learning environment: Springboard or safety net? *Accounting Education,* 15(2): 151-166.

Lowenthal, P.R. 2010. *The evolution and influence of social presence theory on online learning*. Online Education and Adult Learning. New Frontiers for Teaching Practices, pp124-139. Hershey, PA: IGI Global.

Lutz, S. and Huitt, W. 2004. Connecting cognitive development and constructivism: Implications from theory for instruction and assessment. *Constructivism in the Human Sciences,* 9(1): 67-90.

Maher M.W. 2000. Management Accounting Education at the millennium. *Issues in Accounting Education*, 15(2): 335-346.

Makokha, G.L. and Mutisya, D.W. 2016. Status of e-learning in Public Universities in Kenya*. International Review of Research in Open and Distributed Learning*, 17(3). Available from: http://www.irrodl.org/index.php/irrodl/article/view/2235/3700 [Accessed 25 May 2017].

McMillan, J.H. and Schumacher, S. 2001. *Research in Education: A Conceptual Introduction*, London: Longman.

Miles, M.B., Huberman, A.M., and Saldana, J. 2014. *Qualitative Data Analysis*. Arizona: Sage Publications.

Milner, J. Porter, G. and Hampshire, K. 2016. *Mobile phones and education in Sub-Saharan Africa: From Youth Practice to Public Policy*. 3rd Edition. Sage Publications.

McGill, T.J. and Hobbs, V.J. 2008. How students and instructors using a virtual learning environment perceive the fit between technology and task. *Journal of Computer Assisted Learning*, 24(3): 191-202.

Means, B. Baika, M. and Murphy, R. 2014. *Learning online: What research Tells Us about Whether, When and How.* New York NY: Routledge.

Mehrabian, A. 1972. *Nonverbal communication.* Aldine – Atherton, Illinois: Chicago.

Mittal, A., Pagalthivarthi, K.V. and Altman, E. 2007. *Integrating Multi-media Cues in E-Learning documents for Enhanced Learning, Flexible Learning in an Information Society*, B. H. Khan (ed.), Information Science Publishing: Hershey.

Moore, M. 1989. Three Types of Interaction. *American Journal of Distance Education.* 3: 1-7. 10.1080/08923648909526659

Moore, J.C., Dickson-Deane, C. and Galyen, K. 2010. E-Learning, online learning, and distance learning environments: Are they the same? *Internet and Higher Education*, 4: 129-135.

Moore, M.G., and Kearsley, G. 2012. *Distance Education: A systems view of online learning*, Wadsworth: Cengage Learning.

Mouton, J. 2001. *How to succeed in your Masters and Doctoral studies: A South African guide and resource book*. Pretoria: Van Schaik.

Murray, M., Perez, J., Geist, D. and Hendrick, A. 2012. Student interaction with online course content: Build it and they might come. *Journal of Information Technology Education: Research.* 11: 125-139.

Mutagh, L. and Webster, M. 2010. Scaffolding, teaching, learning and assessment in Higher Education. *Tean Journal* 1(2). Available from: http://bit.tyfJ5M. [Accessed 28 October 2016].

Myburgh, F. and Sithebe, C.D. 2006. *Methodologies used for the development of myUnisa in an Open Source environment*. *my*Unisa software development methodology. Available from: https://www.academia.edu/2603800/Methodologies_used_for_the_development_of_*my*Unisa_in_an_Open_Source_environment.Accessed on 31 July 2014.

Naidu, S. 2006. *E-Learning: A guidebook of principles, procedures and practices*. New Delhi: CEMCA.

Nelson, R.R. and Winter, S.G. 2010. *An evolutionary theory of economic change.* Cambridge: Belknap Press.

Neuman, L.W. 2011. *Social Research Methods: Qualitative and Quantitative Approaches*. Boston: Pearson.

Nisar, M.W., Munir, E.U. and Ali Shad, S. 2012. Usage and Impact of ICT in Education sector; A study of Pakistan. *Australian Journal of Basic and Applied Science.* 5(12): 578-583.

Novin, A.M., Arjomand, L.H. and Jourdan, L. 2003. An investigation into the preferred Learning Styles of Accounting, Management, Marketing, and General Business Majors. *Teaching and Learning*, 18(1): 24-31.

Opperheim, A.N. 2005. *Questionnaire Design: Interviewing and Measurement.* Printer publications.

O'Neill, G. and McMahon, 2005. What does it mean for Students and Lecturers? Emerging Issues in the Practice of University Learning and Teaching, G. O'Neill et al (eds.), Dublin, All Ireland Society for Higher Education (AISHE), Available from: http://www.aishe.org/readings/2005-1/collection.pdf [Accessed 16 May 2017].

O'Neill, G.; Moore, S. and McMullin, B. 2005. *Emerging issues in the practice of university learning and teaching:* Dublin: AISHE.

Omona, W., van der Weide, T. and Lubega, J. 2010. Using ICT to enhance Knowledge Management in higher education: A conceptual framework and a research agenda, *IJEDICT*, 6(4): 83-101.

Onwuegbuzie, A.J., and Johnson, R.B. 2004. Validity issues in mixed methods research. Paper presented at the annual meeting of the American Educational Research Association, San Diego, CA

Onwuegbuzie, A.J., Bustamante, R.M. and Nelson, J.A. 2010. Mixed Research as a Tool for Developing Quantitative Instruments, *Journal of Mixed methods Research,* 4(1): 56-78.

Onwuegbuzie, A.J. and Leech, N.L. 2010. The mixed Research Journey: From where we started to where we hope to go. *International Journal of Multiple Research Approaches*, 4: 73-88.

Orapin, D., Gray, D. and Williams, M. 2007. Transactional distance theory applied when designing international accounting online courses. *The Texas Journal of Distance Learning*, 4(1): 13-24. Available from: http://www.txjdl.org/articles/v4i1/duangploy/duangploy.pdf)

Oxford Living Dictionary. 2018. Oxford University Press. Available from: https://en.oxforddictionaries.com/definition/questionnaire [Accessed 31 January 2018].

Page, G.A. and Kennesaw, R.A. 2009. The power and promise of Web 2.0 tools. In: Payne CR (ed.). *Information Technology and Constructivism in Higher Education.* London: Information Science Reference.

Parker, G. 2015. Teachers' Autonomy, *Research in Education,* 93(1): 19-33.

Pastor, R., Hernández, Read, T. and Castro, M. 2010. An enterprise e-learning solution: The practical case of the UNED in the EHEA, Education Engineering (EDUCON), 2010 IEEE, Madrid, Spain, pp611-619.

Pavlov, I.P. (1902). *The work of the digestive glands*. London: Griffin.

Payne, C. 2009. *Information Technology & Constructivism in Higher Education.* Progressive Learning Frameworks. Hershey - IGI Global -NY.

Payne, C.R. and Reinhardt, C.J. 2008. Can we talk? Course management software and the construction of knowledge, *On the Horizon,* 16(1): 34-43.

Pearson, C. 2010. *The benefits of online learning.* Charter. Sydney. 81(3). Pedagogical principles – A pedagogical model for eLearning. Available from: http://www.divinitus.ca/documents/claroline.pdf. Accessed on 15 August 2014

Penner, J.L. and McClement, S.E. 2008. Using Phenomenology to Examine the Experiences of Family Caregivers of Patients with Advanced Head and Neck Cancer: Reflections of a Novice Researcher. *International Journal of Qualitative Methods*. 7(2): 92-101.

Phipps, R.A. and Merisotis, J.P. 2000. *Quality on the line: Benchmarks for success in Internet-based education*. The Institute for Higher Education Policy web site, Available from: http://www.ihep.com/Pubs/PDF/Quality.pdf [Accessed 25 June 2017].

Piccioli, V. 2014. *E-Learning Market Trends & Forecast 2014 - 2016 Report.* Toronto: Docebo. Available from: https://www.twid.fi/file/original/elearning-market-trends-and-forecast-2014-2016-docebo-report.pdf [Accessed 28 November 2017].

Pretorius, M. 2008. Technical Report: *my*Unisa Assignment Submission Tool: Usability Report. Available from: http://osprey.unisa.ac.za/TechnicalReports/TR-UNISA-2009-01A.PDF, [Accessed 23 March 2017].

Research Advisor. 2006. *Sample Size Table.* Available from: http://research-advisor.com/documents/sample-size-web [Accessed 27 June 2017].

Richardson, J.C. and Swan, K. 2003. An Examination of Social Presence in Online Courses in Relation to Students' Perceived Learning and Satisfaction, *Journal of Asynchronous Learning Network,* 7(1): 68-88.

Rudestam, K.E. & Schoenholtz-Read, J. 2010. *Handbook of online learning*. 2nd Edition. Los Angeles: Sage.

Saito, H., Takaku, M., Egusa, Y., Terai, H., Miwa M. & Knado N. 2010. Connecting Qualitative and Quantitative Analysis of Web Search Process: Analysis Using Search Units. *Proceedings of 6th Asian Information Retrieval Symposium; Information Retrieval Technology. Taipei*, December 1-3. Springer.

Sapford, R. 2007. *Survey Research,* 2nd edition, Los Angeles: Sage Publications.

Saunders, M. Lewis, P. and Thornhill, A. 2012. *Research Methods for Business Students.* Cambridge: Pearson.

Schank, R.C. 2005. *Lessons in learning, e-Learning and training.* San Francisco: Pfeiffer.

Sharpe, R., Beetham, H. and De Freitas, S. 2010. *Rethinking Learning for a Digital Age. How learners are shaping their own experiences,* New York: Routledge.

Schneider, M., & Stern, E. 2010. The cognitive perspective on learning: Ten cornerstone findings. In Organisation for Economic Co-Operation and Development (OECD) (Ed.), *The nature of learning: Using research to inspire practice* (pp. 69-90). Paris: OECD.

Sher, A. 2009. Assessing the relationship of student – instructor and student – student interaction to student learning and satisfaction in Web – based online learning Environments. *Journal of Interactive Online Learning.* 8(2): 102-120.

Siebert, H. 2002. Constructivism: an epistemological change. In: Bron, A. and Schemmann, M. (ed.). *Social science theories in adult education research*. New Brunswick: Transaction Publishers.

Siegel, G., Sorensen, J.E., Klammer, T. and Rightermeyer, S.B. 2010. The ongoing preparation gap in Management Accounting. Accounting education: A guide for change. *Management Accounting Quarterly*, 11(4): 29-39.

Silverman, D. 1997. *Qualitative research : theory, method, and practice*. Thousand Oaks California: Sage Publications.

Simpson, O. 2012. *Supporting Students in Online, Open and Distance Learning*, 3rd Edition, Routledge, New York.

Singer, R.A. and Wiesner, The Future of Undergraduate Accounting Programs and Curricula. *Management Accounting Quarterly,* 14(4): 22-31.

Skinner, B.F. 1953. *Science and Human Behavior*. New York. MacMillan.

Ssekakubo, G., Suleman, H. and Marsden, G. 2011. Issues of adoption: Have E-Learning Management Systems fulfilled their potential in Developing countries? *SAICSIT*, 1 Oct 3-5. 2011 Cape Town.

Ssemugabi, S. and de Villiers, M.R. 2010. Effectiveness of heuristic evaluation in usability evaluation of e-learning applications in higher education. *South African Computer Journal*, 45: 26-39.

Suppes, P. 1966. The uses of computers in education. *Scientific American*, 215: 206-220.

Suri, H. & Schumacher, M. 2008. Open-Source vs Proprietary VLE: An Exploratory Study of staff perceptions. *Ascilite Proceedings: 2008* Melbourne, pp1002-1006.

Sukhoo, A., Barnard, A. Eloff, M.M. and van der Poll, J.A. 2007. An Evolutionary Software Project Management Maturity Model for Mauritius, *Interdisciplinary Journal of Information, Knowledge, and Management,* 2: 99-118.

Survey Face. Available from: http://Surveyface.com/

Tarus, K.J., Gichoya, D. and Muumbo, A. 2015. Challenges of implementing E-Learning in Kenya: A Case of Kenya Public Universities, *The International Review of Research in Open and Distributed Learning*, 16(1). DOI: http://dx.doi.org/10.19173/irrodl.v16i1.1816.

Tuli, F. 2010. The basis of distinction between Qualitative and Quantitative Research in Social Science: Reflections on Ontological, Epistemological and Methodological perspectives. Ethiopian *Journal of Education and Science.* 6(1): 97-108.

University of South Africa (Unisa). 2013. http://www.unisa.ac.za. Accessed on 20 September 2013.

University of South Africa (Unisa). 2014. http://www.unisa.ac.za Accessed on 20 August 2014.

Unisa. 2016. Introductory Financial Mathematics. Department of Decision Sciences. Unisa. Pretoria.

Unwin, T. 2008. Survey of e-Learning in Africa: based on a questionnaire survey of people on the e-Learning Africa database in 2007. *African Higher Education Research,* Available from: Online, http://ahero.uwc.ac.za/index.php?module=cshe&action=viewtitle&id=cshe_441, [Accessed 28 March 2018].

Van der Merwe, H. 1996. *The research process: Problem statement and research design,* 278-291. In Garbers, J.G. (Ed.). Effective research in the human sciences. Pretoria: J.L. Van Schaik

Van der Poll, J.A. and Dongmo, C. 2012. The teaching of operating systems in a non-classroom environment. *Progressio, South African Journal for open and distance learning practice,* 34(3): 18-36.

Van Schoor, W. 2013. All they need is some TLC: Revisioning the regional support structures in a distance education institution with specific emphasis on the development of the student success centre, pp1-5. Available from: http://fyhe.com.au/past_papers/papers13/14C.pdf. [Accessed 31 July 2014].

Van Rooyen, A. 2015. Distance Education Accounting students' perceptions of social media integration. *Procedia – Social and Behavioral Sciences*. 176: 444-450.

Venter, P., Jansen van Rensburg, M. and Davis, A. 2012. Drivers of Learning Management System Use in a South African Open and Distance Learning Institution. *Australasian Journal of Educational Technology,* 28(2): 183-198.

Verenikina, I. 2008. *Scaffolding and learning: its role in nurturing new learners.* University of Wollongong: Research Online.

Von Glasersfeld, E. 1995. A constructivist approach to teaching. In: Steffe LP & Gale, J.E. (ed.). *Constructivism in education.* New Jersey: Lawrence Erlbaum Associates, Inc.

Vygotsky, L.S. 1978. *Mind in society: The development of higher psychological processes.* Cambridge, MA: Harvard University Press.

Wade, W. 1999. What Do Students Know and How Do We Know that They Know It? *Technical Horizons in Education,* 27(3): 94-97.

Wang, H. and Liu, Y. 2009. A comparative study on e-learning technologies and products: from East to West. *Systems Research and Behavioral Science*. 26(2): 191-209.

Wanyembi, G.W. 2011. *Institutions of Higher Learning in Emerging Economies.* Mount Kenya University. IGI Global. DOI:10.40181978-1-4666-9764.ch008.

Wolley, D.R. 1994. PLATO: The emergence of on-line community. *Computer-Mediated Communication Magazine*, 1(3): 5.

Young, S., and Duncan, H.E. 2014. Online and Face-to-Face Teaching: How Do Student Ratings Differ? *MERLOT Journal of Online Learning and Teaching*. 10: 70-79.

Zhang, S., Zhao, J., and Tau, W. 2008. Extending TAM for Online Learning Systems: An Intrinsic Motivation Perspective. *Tsinghua Science & Technology*. 13: 312-317.

APPENDIX A: QUESTIONNAIRE

SECTION A: PERSONAL PARTICULARS			
AGE		NATIONALITY	
GENDER		OCCUPATION	
RACE			

SECTION B: USE OF ICTs AND ODL KNOWLEDGE TRANSFER

a) To what extent do you agree or disagree with the following statements about the use of ICTs in facilitating ODL knowledge transfer (tick one box only)?

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
1) I have access to a computer for use in my studies.					
2) I have been exposed to the Internet before I started with my studies.					
3) I have been exposed to e-learning before I started with my studies.					
4) I sometimes experience connectivity challenges with the Internet.					
5) I sometimes experience power failures making it difficult for me to study.					
6) *my*Unisa enables me to download study material and assignment questions.					
7) I am able to participate in discussion forums on the *my*Unisa platform.					
8) *my*Unisa gives me access to past examination papers.					
9) I am able to "*practise endless repetition*" by working out assignment questions and past examination papers that are posted on the *my*Unisa learning environment.					

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
10) *The my*Unisa platform is easily accessible to me.					
11) The features on *my*Unisa are clear and easy to follow.					
12) I find that the use of *my*Unisa is generally affordable to me with regard to internet access.					
13) The structure of the options on *my*Unisa is easy to follow.					
14) I do my registration online on *my*Unisa at the beginning of each academic year.					
15) I submit/resubmit my assignments on *my*Unisa.					
16) I can track parcels from me to Unisa on the *my*Unisa platform.					
17) Examination results are published on the *my*Unisa platform.					
18) The opportunity to be in control of my learning via *my*Unisa to learn at a time, place and pace that suits me, improves my learning experiences.					
19) The study material on *my*Unisa enables me to construct my own meaning of the subject matter.					
20) The study material on *my*Unisa enables me to construct my own understanding of the subject matter.					

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
21) The additional resources section allows me to understand difficult subject content as it develops the content from the simple to the complex (scaffolding).					
22) The *my*Unisa learning platform is structured in a manner that exposes students to opportunities for experiential learning.					
23) The opportunity to learn using *my*Unisa at a time, place and pace to suit myself encourages me to learn independently.					
24) The way in which Management Accounting is set up encourages me to learn independently.					
25) For Management Accounting, the activities on *my*Unisa generally encourage me to engage with other students.					
26) The resources on *my*Unisa for Management Accounting are mainly for information purposes.					
27) *my*Unisa has a positive impact on my effectiveness as a student.					
28) *my*Unisa is an important and valuable aid to me in my studies.					
29) I can learn more with *my*Unisa than without it.					

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
30) *my*Unisa improves the quality of my learning.					

b) Indicate your frequency of use on each of the following statements (tick one box only).

	Never	Rarely	Sometimes	Often	Always
a) I use quizzes on *my*Unisa.					
b) I use blogs on *my*Unisa.					
c) I use of hyperlinks on *my*Unisa.					
d) I participate in discussion forums on *my*Unisa.					
e) I get feedback to my assignments on *my*Unisa.					
f) I use podcasts on *my*Unisa.					
g) I use vodcasts on *my*Unisa.					

APPENDIX B: INTERVIEW PROTOCOL

Interview Questions

Distance Education

1. What would you regard as the major shortcoming of distance education?
2. What barriers to learning did you experience in the traditional distance form of study?
3. What other barriers can you think of in the traditional distance form of study?
4. What advantages of distance education did/do you experience?

Management Accounting Education

5. How can we facilitate Management Accounting education so that students learn by doing?
6. What new subject content can a student learn in the Management Accounting module?
7. To what extent are Management Accounting graduates well prepared for the demands and expectations of the business world?

Use of Technology

8. What is your definition of online learning?
9. What are some of the factors that lead to disillusionment of the lecturer with new technologies?
10. What issues must a higher education institution address in order to facilitate the success of an online learning initiative?
11. How can mobile technologies be used by institutions and students to assist in distance learning?
12. How can instructors become better equipped for e-learning?
13. How proficient are the students in the use of the relevant computing technology (hardware and software)?
14. Are there mechanisms for preparing both students and academic staff to use available technologies effectively enough?

a. What are such mechanisms?

15. What e-learning resources do you think should be made available for every student?

Virtual Learning Environments

16. What is your definition of a VLE?
17. Does the use of a VLE have a positive impact on student learning?
18. Does the use of a VLE in teaching and learning help develop student independent learning?
19. Does the use of a VLE for teaching and learning facilitate the students' knowledge acquisition in the subject?
20. Does the use of a VLE for teaching and learning facilitate the students' knowledge construction in the subject?
21. What are the potential benefits of using online synchronous discussion with undergraduate students?
22. What are the potential limitations of using online synchronous discussion with undergraduate students?
23. What are your perceptions of the use of an "online tutorial" versus the more traditional face-to-face tutorial?
24. What recommendations would you make to educators delivering online tutorials with students?

APPENDIX C: ETHICAL CLEARANCE

UNISA university of south africa

RESEARCH PERMISSION SUB-COMMITTEE OF SRIHDC

26 January 2015

Ref #: 2015_RPSC_002
Mr Trust Kashora
Student #: 4719484
Staff #:

Dear Mr Trust Kashora,

Decision: Research Permission Approval

Name: Mr Trust Kashora
Department of Management Accounting
College of Accounting Sciences
UNISA
trustkash@yahoo.com
073 279 4446

Supervisors:
Prof HM van der Poll
vdpolhm@unisa.ac.za
Prof JA van der Poll
vdpolja@unisa.ac.za

A study titled: "E-Learning Technologies for Open Distance Learning Knowledge acquisition in Management Accounting."

Your application regarding permission to conduct research involving UNISA staff in respect of the above study has been received and was considered by the Research Permission Subcommittee of the UNISA Senate Research and Innovation and Higher Degrees Committee (SRIHDC) on 20 January 2015.

It is my pleasure to inform you that permission has been granted for this study as per your application, for the period between 1 February 2015 and 28 March 2016, with reference to:

- Access to the MyLife email addresses of students registered for Management Accounting (MAC2601 & MAC2602) in 2014 and 2015 in order to distribute a web-based survey.
- The recruitment of lecturers of the Management Accounting Course (MAC2601 &

University of South Africa
Preller Street, Muckleneuk Ridge, City of Tshwane
PO Box 392 UNISA 0003 South Africa
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150
www.unisa.ac.za

MAC2602) to participate in interviews relevant to your study.

You are requested to submit a report of the study to the Research Permission Subcommittee (RPSC@unisa.ac.za) within 12 months of completion of the study.

Note:

The reference number [2015_RPSC_002] should be clearly indicated on all forms of communication with the intended research participants.

We would like to wish you well in your research undertaking.

Kind regards,

PROF L LABUSCHAGNE

EXECUTIVE DIRECTOR: RESEARCH

***Tel**: +27 12 429 6368 / 2446*
***Email**: llabus@unisa.ac.za*

University of South Africa
Preller Street, Muckleneuk Ridge, City of Tshwane
PO Box 392 UNISA 0003 South Africa
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150
www.unisa.ac.za