Towards a culture-oriented e-Learning System Development Framework in higher education institutions in South Africa

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DECLARATION

I hereby declare that

Towards a culture-oriented e-Learning System Development Framework in higher education institutions in South Africa

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JOSHUA EBERE CHUKWUERE

DEDICATION

I dedicate this thesis to God Almighty, “For the LORD giveth wisdom: out of his mouth cometh knowledge and understanding” (Proverbs 2:6), my late Father, Pastor Felix Chukwuere, and the entire family of Chukwuere for their prayers and support in making this study possible.

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ABSTRACT

Over four decades ago, software design and development was marked with crisis as a result of a number of reasons and the development has led to a chain of transformation mainly in the area of methodologies and approaches used during the development procedures. The crisis is still on-going not minding the huge efforts applied by researchers to preclude the issue. Nonetheless, the crisis affects the implementation of e-learning system in the area of integration of learner's culture in the development process and designing culture-oriented e-Learning system. Culture-oriented e-Learning system has not been addressed nor given attention in the on-going development crisis. Although some researches claim to have reduced the effect of software crisis with the evolution of new approaches, frameworks, paradigms and methodologies. In an effort to understand culture in an organisation, Hofstede researched extensively in 1980's on the impact upon national and organisational culture in an organisation and many other researchers followed suit to attain concord with his research findings. But the truth of the matter is that these researchers' efforts and the findings failed to recognise or present individual cultures and cultural factors in the development of any e-Learning systems.

Furthermore, South Africa is a country with eleven (11) official languages and different cultural practices spreading across nine (9) provinces. The choice of learning tools is influenced by these languages and cultures. South African societal values can be influential in e-Learning set-up and environment. Human learning capacity is influenced by many factors like culture. Organisations and educational institutions are trying hard in making teaching and learning widely available to learners at all times, but cultural influence can be regarded as crisis during the development and implementation process. In making e-Learning user-friendly, teachers (instructors) and researchers have researched implementable programmes on e-Learning. Some studies show that e-Learning has the potential of making communication between instructors (lecturers) and learners (students) more effective and efficient. In spite of all these, students do drop out from courses on e-Learning. Nonetheless a lesson can be derive from Chinese culture because a released report shows that Chinese culture is teaching and learning (teacher-oriented) friendly, Chinese students do not favour constructive learning environment compared to blended-teaching and learning environment. In the SA education context, students are coming from different backgrounds, societies, cultures and with different characteristics, specifications and learning styles.

The fact that learners come from different cultural-backgrounds posed a challenge to capture culture and in the development of the e-Learning system. The inability to capture learners'

cultural differences has led to participants suggesting the user(s) involvement and consultation in the design process and inclusion of the following components: cultural, community, administrative, content, learning style, Activity/Exercise Factor (AEF) and others will led to culture-oriented e-Learning system design and implementation. The constructive research approach (CRA) was truly suitable for this study in developing a culture-oriented framework. A data was collected via mixed research approach by means of structured interviews and closed-ended questionnaires from North-West University (NWU); University of the Witwatersrand (Wits) and University of Cape Town (UCT). The interview aimed at e-Learning developers and administrators while the closed-ended questionnaires derived data from learners (students) that use e-Learning platform on daily basis. Lastly, findings were drawn based on data collected by which "Seven cycle culture-oriented e-Learning system framework" (SCCOe-LSF) was developed. The new framework will assist to accommodate learners' culture differences in the development and implementation of culture-oriented e-Learning system. Also, this e-Learning framework will help in achieving a desired teaching and learning purpose and addressing the long standing software crisis and development needs. At the end, a conclusion was drawn and recommendations made on future improvement and studies.

Keywords: Software crisis, Culture-oriented, Culture, e-Learning systems, Framework, System development, Cultural factors, Learner's culture, Software development.

PUBLICATIONS

These are different academic papers published from this thesis:

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LIST OF ABBREVIATIONS AND ACRONYMS

AA	-	Agile Alliance
AC	-	Axial Coding
ADDIE	-	Analysis, Design, Development, Implementation, and Evaluation
ADL	-	Advanced Distributed Learning
AEF	-	Activity/Exercise Factor
AM	-	Aggregation Model
AM	-	Agile Modelling
ANT	-	Actor-Network Theory
AP	-	Agile Approach
ASC	-	Academic Support Centres
ASD	-	Adaptive Software Development
AT	-	Activity Theory
AUP	-	Agile Unified Process
CA	-	Constructive Approach
CAQDAS	-	Computer-Assisted Qualitative Data Analysis Software
CBT	-	Computer-Based Technology
CCSESA	-	California County Superintendents Educational Services Association
CF	-	Community Factors
CI	-	Coding Issues
CMC	-	Computer-Mediated Communication
CO	-	Culture-Orientation
CO	-	Culture-Oriented
CRA	-	Constructive Research Approach

CRP	-	Constructive Research Paradigm
DE	-	Distance Education
DL	-	Distance Learning
DL/E	-	Distance Learning/Education
DOE	-	National Department of Education
DPSDM	-	Design Plan, System Development Methodology
DSDM	-	Dynamic Systems Development Method
E-learning	-	Electronic Learning
e-LS	-	e-Learning System
e-LSDF	-	e-Learning System Development Framework
FAO	-	Food and Agriculture Organisation
FDD	-	Feature Driven Development
FTF	-	Face-To-Face
GFE	-	Generated Framework Evaluation
GNTC	-	Generated Network of Themes and Codes
HEI	-	Higher Education Institutions
ICT	-	Information and Communications Technology
ID	-	Instructional Design
ILO	-	Intended Learning Outcomes
INTDN	-	Interview Document Number
IS	-	Information Systems
ISD	-	Information System Development
IT	-	Information Technology
JAD	-	Joint Application Development

LMS	-	Learning Management System
LO	-	Learning-Object
LOM	-	Learning Object Metadata
LSD	-	Lean Software Development
LTO	-	Long-Term Orientation
MMR	-	Mixed Method Research
MOODLE	-	Modular Object-Oriented Developmental Learning Environment
NADEOSA	-	National Association of Distance Education and Open Learning in South Africa
NATO	-	North Atlantic Treaty Organisation
NWU	-	North-West University
OCP	-	Open Coding Process
ODL	-	Open Distance Learning
OL	-	Online Learning
OUT	-	Open University of Tanzania
PHEA	-	Partnership for Higher Education in Africa
PLE	-	Personal Learning Environment
QDAP	-	Qualitative Data Analysis Process
RF	-	Research Framework
SA	-	South Africa
SAS	-	Statistical Analysis System
SC	-	Software Crisis
SCCOe-LSF	-	Seven Cycle Culture-Oriented e-Learning System Framework
SCF	-	Social and Cultural Factors
SCORM	-	Sharable Content Object Reference Model

SCORM-SNM-		Sequencing and Navigation Model
SDA	-	Systems Development Approaches
SDLC	-	Development Life Cycle
SDM	-	System Development Methodology
SDM	-	Software Development Methodology
SDMAM	-	Systems Development Methodologies, Approaches and Models
SDML	-	Systems Development Model
SE	-	Software Engineering
Spiral-ED	-	Spiral-Education
SPSS	-	Statistical Package for the Social Sciences
SS	-	Social Software
TEC	-	Thesis Evaluation Criteria
TOCT	-	Thematic Open-Coding Themes
TOGAF	-	The Open Group Architectural Framework
UCT	-	University of Cape Town
UNISA	-	University of South Africa
USA	-	United State of America
VLE	-	Virtual Learning Environment
Wits	-	University of the Witwatersrand
WM	-	Waterfall Model
XP	-	Extreme Programming

CHAPTER ONE

INTRODUCTION TO THE STUDY

1.1. INTRODUCTION

The development of educational software requires the full understanding of techniques, methodologies, frameworks, theories, principles, philosophy, psychology and culture in systems development. History and current trends are fast re-defining Information Technology (IT), software development, teaching and learning and culture. The dynamic and powerful element of culture impacts upon behaviours, beliefs and others in determining lawful information in any society (Leidner & Kayworth, 2006). The software crisis (SC) which has lasted for decades now Haigh (2010) could be attributed to cultural over-burdening, and societal negligence in the development of e-Learning systems. The benefits, significance and barriers attached to culture in e-Learning systems development cannot therefore be over-emphasized (Mohammed & Mohan, 2011). Then, addressing learners' culture negligence in the development is a means in tackling the existing software crisis.

Currently, the global economic situation is pushing small, medium and large organisations, including individuals, to seek better ways of minimising costs associated with technologically-driven systems. However, Information and Communications Technology (ICT) could effectively be used in empowering electronic-learning (e-Learning) and dealing with the fluid global economic situations (Dac & Bregman, 2010). Positive cultural integration into e-Learning cannot be neglected, because it could propel learners to use e-Learning content and services effectively and efficiently. The issue of the impact upon Information Systems (IS) on culture vice versa dates back to the 1970s (Kummer, Leimeister & Bick, 2012). In 1980, Hofstede introduced new dimensions on organisational and national culture which are rooted in the role of culture in IS design and management. From induction, many research studies have revolved around these dimensions. Other studies have been done on e-Learning methodologies (Fardoun & Alghazzawi, 2012; Gilbert, Sim & Wang, 2005; Nawaz, Hussain & Zaka, 2013), frameworks (Andersson & Grönlund, 2009; Kaewkiriya, 2013; Lee, 2013; Smith & Hardaker, 2000), and e-Learning theories (McGonigal, 2005; Wilson & Peterson, 2006), but all these research studies have not provided academic learning space on how to capture and incorporate learners culture into the development of e-Learning systems.

From all indications, there is a problem of learner's culture negligence in the development which needed solution(s). In this study, it stands for the necessity of learner's culture on e-Learning system development because learning occurs in an environment where culture exists. For an effective use of e-Learning system tools and software, culture must be widely considered in the development process, meaning that culture should be embedded in e-Learning system. The embodiment of culture in learning allow for easy flow of e-Learning software development and usage (Mayes & de Freitas, 2004).

This study was carried out using mixed research methods, structured interviews and questionnaires in gathering data from North-West University (NWU), University of the Witwatersrand (Wits) and University of Cape Town (UCT). The justification for the selected sample is discussed in depth in the research methodology (Chapter 4). A framework was developed on how to include learners cultural factors in the development of e-Learning system in diverse learning environments. Again, the study also attempts to understand how the three institutions selected for this study have managed to capture learners' cultural factors in the development of e-Learning system.

The chapter provides the research details following the headings subsequent here: background and context, definition of terms, research motivation, problem statement, research questions, research objectives, research design and methodology, literature survey, significance of the study, limitations of the study, study layout and conclusion.

1.2. BACKGROUND AND CONTEXT

South Africa (SA) of the post-apartheid era has produced a mixed educational system. SA has 23 universities with two news ones (Sol Plaatje University and University of Mpumalanga) established on the 19th September and 31st October 2013 respectively. Some of these 23 universities exist as a result of the merger with other higher educational institutions. SA has a diverse population and cultures. Post-apartheid education enrolment in SA has grown from 104,000 in 1990 to above 300,000 in 2008. Consequent upon this growth in enrolment, there has been a significant boost in Distance Education (DE). Distance education accounts for about 38% of higher education enrolment in the country and 85% of students registered at University of South Africa (UNISA) are on distance learning (Lephalala & Makoe, 2012). UNISA is the largest and oldest distance learning institution in Africa, registering over 350,000 students in 2015. Its influence is felt far afield in Africa and it is cited as a well-endowed Open Distance Learning (ODL) institution across different countries, cultures and languages (UNISA, 2014).

In comparison with conventional educational institutions, distance learning and e-Learning systems aim to extend educational access. Distance learning is important because it aims at meeting learners' needs individually. It involves e-Learning that brings about "psychological and communication" separation and learners need to be weaned from the cultural tradition of contact sessions into distance education culture (Lephalala & Makoe, 2012). Societal, institutional and classroom culture have an impact upon the open learning system development and this is forged on e-Learning platforms.

Overall, the state of ICTs infrastructure at higher institutions in SA depends on the nature of the national educational environment and budget (Ngugi et al., 2007). ICT involves the use of technology to transfer data and data storage through electronic channels. This transfer involves software or applications (text message, e-mail, chat, and video) and hardware (desktop, laptop, and server) as identified by Perron, Taylor, Glass & Margerum-Leys (2010). SA has a high standard of telecommunication infrastructure connection when compared to other sub-Saharan African nations (Ngugi et al., 2007).

The twenty-first century technology has re-defined traditional learning and class-based education (Olaniran, 2009). This re-definition is as a result of ICT and online resources being enabled by Computer-Mediated Communication (CMC) systems. This system has enabled organisations and individuals to take the destiny of their education into their own hands, at their own convenience (Olaniran, 2009). In the SA education context, students come from different backgrounds, societies, cultures and bring along with them different characteristics, specifications and learning styles (Boondao, Hurst & Sheard, 2009).

Furthermore, South Africa is a country with eleven (11) official languages and different cultural practices spread across nine (9) provinces. The choice of learning tools in this diversity is influenced by these languages and cultures. South African societal values are influential in e-Learning set-up and environment. Human learning capacity is also influenced by many factors like culture (Boondao et al., 2009). Organisations and educational institutions are making tangible strides in making teaching and learning widely available to learners at all times, and therefore cultural influences, including adaptability, could be regarded as critical during the development and implementation of CMC processes. In making e-Learning user-friendly, teachers (instructors) and researchers have researched implementable programmes on e-Learning (Oyelami, 2008; Kolås & Staupe, 2004). Some studies show that e-Learning has the potential of making communication between instructors (lecturers) and learners (students)

more effective and efficient. In spite of all these positive attributes of e-learning, students continue to drop out from courses on e-Learning (Boondao et al., 2009).

Again, a recent report shows that Chinese culture in teaching and learning (teacher-oriented) is more friendly because Chinese students do not prefer constructive learning environments compared to blended-teaching and learning environments (Mohammed & Mohan, 2011). According to Hudley and Daoud (2007), the background of Latino students is more positive in relation to teachers than those of an Anglo background culture which is more focused on validation learning environments with a warm relationship. These differences show that cultural inclinations and persuasions differ from one culture to another (Mohammed & Mohan, 2011), and consequently weigh heavily in favour of CMC processes in specific contexts.

1.3. DEFINITION OF TERMS

The following terms are used in this study and this segment define the following: Distance education, Framework, Culture, Culture-oriented (CO) and e-Learning system development framework (e-LSDF).

1.3.1. Distance education (DE)

The 1960s founding fathers of distance education are Otto Peters, Borje Holmberg and Michael Moore. During the 1960s, however, the study of Charles Wedemeyer shaped the history of distance education (Garrison, 2000). Each of the pioneers defined distance education differently but all shared common ideas about its architecture and utility.

In 1979, Moore defined distance education as "the family of instructional methods in which the teaching behaviours are performed apart from learning behaviours." While Holmberg in 1981, defined it as "organized educational programme"; Wedemeyer, in 1977, saw it as "independent study which consists of various forms of teaching-learning arrangements in which teachers and learners carry out their essential tasks and responsibilities apart from one another." In 1973, Otto defined it as an "industrialised form of teaching and learning" (Pyari, 2011: 94).

Other researchers added to these definitions, for example, distance education is a physical and geographical separation between learners and teachers in teaching and learning (Guri-Rosenblit, 2005). The unique characteristic is distance or separation of teachers and learners (Moore, 2011). But the separation only takes place to a certain level. The distance causes "a psychological and communications gap", a misconception and misunderstanding between

teacher input and learner output. Generally, distance education is a division of education programmes that separates teachers and learners; the separation can affect both parties' behaviours and attitudes, and it demands special teaching and learning methods to bridge the gap (Moore, 2011), and culture-oriented e-Learning system could be the alternative.

The recognition of distance education as a method of education (teaching and learning) allows for the application of teaching and learning from conventional education viewpoints in both the "theory and practice of distance education" (Moore, 2011: 4). The amount of opportunity, content quality, the collaboration between teacher and learner and infrastructure built and allocated by educational institutions determine the success and failure of distance learning. This means that an increase in dialogue and collaboration reduces the distance through teleconferencing, internet centre connectivity and many more (Moore, 2011). In these definitions, some scholars criticised such arrangements in their own way, but one common thing is, it exists between teacher (teaching) and a learner (learning) apart. Distance education is discussed in detail in Chapter two (2) of this study.

1.3.2. Framework

A framework is an "architectural presentation" process for developing engineering systems for different users and descriptions (Zachman, 1987). In the development arena, a framework is a structured body of literature that enables developers to close the gaps in the development of software (Wilson et al., 2004). Information systems involve people, procedures, data, hardware and software, most especially the environment where information exists. All the above components need to co-exist for the effective implementation of an IS. In their view, Korpela, Mursu and Soriyan (2002) define a framework as a development design, structure, concept and tool for empirical understanding and representation of context and the engagement of components. In an information systems discipline, a framework enables researchers and practitioners to understand and represent IS settings. Through a framework, guiding principles can be established concerning concepts. In this study, a framework is an onion or structural layer that guides how cultural factors can be modelled, designed and implemented in e-Learning system development. The study develops an e-LSD framework to present the cultural factors or components in e-Learning system (see Figure 7.1).

1.3.3. Culture

A culture can be seen as the set of shared values, ambitions, motives, emotions, identities, beliefs, meanings and interpretations of important phenomena and constructs from similar

knowledge with a collective members and can be transferred to generations (Joy & Kolb, 2009). The study of information technologies (IT) goes with an understanding of culture at different levels involving organisational, national groups and individual levels. These levels can impact upon the success and failure of any system implementation (Leidner & Kayworth, 2006). Directly or indirectly, culture impact upon managerial decisions. Culture is complex because of the "multiple divergent definitions and measures of culture" (Leidner & Kayworth, 2006).

Culture is an indicator of people's behaviours and norms in a diverse environment, even in learning (Blanchard et al., 2005). Culture is a people's way of life, thinking, religion, food, clothing and beliefs. Culture influences how learners (people) react, act and behave in certain situations, people's interactions with the environment, colleagues and how they give meanings to symbols and concepts. According to Kashima (2000), the definition of culture has no double meaning. Some other researchers define culture as "production and reproduction" of ideas in a certain way (Blanchard et al., 2005). Others see it as a system of knowledge sharing and the foundation of symbols meaning that it gives structure to existence and can be exported to influence others. In this study, culture is a set of shared values, attitudes, attributes and concerns among a group of people in a confirmed environment.

Culture influences people (learners) and emotions positively or negatively. In e-Learning, emotions are an important area of concern (Conati, 2002). For example, students from western and eastern countries differs in emotions (Scollon, Diener, Oishi & Biswas-Diener, 2004). Furthermore, students from western countries could pride as positive emotion which is considered as negative in eastern countries (Kim-Prieto, Fujita & Diener, 2004; Blanchard et al., 2005).

Culture can also affect learners' preference individually or collectively (Blanchard et al., 2005), especially when concerns are extrovert or introvert (Cassady, Mohammed & Mathieu, 2004), or when motivation is perceived to be linked to the allocation of a reward (Fischer & Smith, 2003). So, culture and deliberate consideration of learning culture become important for e-Learning system development because these work in tandem with the way specific people behave. The avoidance of cultural content and context risks marginalising learners from different backgrounds (Blanchard et al., 2005). The culture on e-Learning is the inherited attitude or behaviour of people towards e-Learning. Learning culture demands an understanding of how learners assimilate skills and knowledge in their learning environment,

react to change, objective-oriented tasks, including the innovative mind-set and change retainment. Learning cultures are those attributes that encourage learners to develop a good attitude, set goals, values and practice in the learning process (Caldwell, 2011). Learning culture attributes are: 'Personal mastery' or personal command is central in the encouragement of creating goal-minded, social, organisational team effort to in order to succeed. The 'Mental model' or state (the force that changes a learner's mind, behaviour and attitude), 'Shared vision' or shared visual sense (commitment to others) are also attributes to be considered. The Team (group) learning (corporate thinking patterns to excel more than individual thinking skills), 'System thinking' or patterns of thinking (ability to think differently from others) (Caldwell, 2011), Objective-oriented (ability to foresee the future) are additional attributes to be considered. This study defines learning culture as an intrinsic and extrinsic force that reshapes learners' attitudes, values and concerns in the learning environment.

Furthermore, Blanchard et al. (2005) see culture as a dynamic or static system that affords one the ability towards interpretation of symbols, emotions and concepts, beliefs, actions, feelings, and attitudes. Dynamic and static are two areas of culture definition adding to the advantages of e-Learning. Dynamic captures "cognitive assessment" of the emotional status of learners (for example, rules and laws are dynamic). French students, for instance, like collective work environments, while static cultural students prefer otherwise, working as individuals to gather meanings from symbols, practices, beliefs, ideas, actions and behaviours of learners. For example, pride is regarded as a positive behaviour for learners from western countries while such behaviour is shunned in the eastern countries (Blanchard et al., 2005). From the above definitions, culture also can be seen as a system that represents people's ideas and values in a specific environment and culture exists in the midst of people. Good representation of cultural traits on e-Learning drives home the mandate of e-Learning in teaching. This study adopts culture as an attribute that defines people's ways of life.

1.3.4. Culture-Orientation (CO)

Culture-orientation (CO) is the centre point of culture. In this study, it stands for the necessity of culture on e-Learning system development because learning occurs in an environment where culture exists. For an effective use of e-Learning system tools and software, culture must be widely considered in the development process, meaning that culture should be embedded in e-Learning system. The embodiment of culture in learning allow for easy flow of e-Learning software development and usage (Mayes & de Freitas, 2004).

Electronic learning (e-Learning) provides a platform, system or environment for easy and convenient learning process while culture presents learners with the learning environment that is either comfortable or conducive. E-Learning demands remote resources allocation and the developers should consider the cultural setting of learners, their experience, technologies, and culture-orientation (Lanzilotti, Ardito, Costabile & Angeli, 2006). In this study, it symbolises the necessity of culture in the e-Learning system development process.

1.3.5. e-Learning System Development Framework (e-LSDF)

e-LSDF is a proposed development framework for the capturing of learners' cultures in e-Learning development. e-Learning is seen as a good means (Borotis, Zaharis & Poulymenakou, 2004), framework (Wilson, Blinco & Rehak, 2004) and system (Kaewkiriya, Saga & Tsuji, 2013) for educational purposes. Oyelami (2008) defines e-Learning as the use of technology in learning materials and transmission which can be delivered using Internet or intranet. The easy access to education resources anytime, anywhere has boosted academic interest in offering online learning to a huge number of learners (Oyelami, 2008). Companies use it for advancing and training employees for convenience, consistency and accessibility.

System development involves a structure called System Development Methodology (SDM). The process involves techniques, procedures, tools, methods and documentation. All these assist developers to execute a workable system. e-LSDF is a development framework with the ability to present and capture learners' cultures at the heart of system development in this study, because e-LSDF is culture-oriented. However, e-LSDF makes the development process repeatable and sharable in different environments, language, culture and society any time. e-Learning is defined therefore as the use of technological medium positively to impact upon teaching and learning in a framed platform.

1.4. RESEARCH MOTIVATION

The development of e-Learning system platform and tools has brought and continues to bring great changes in education. The tools may depend on learners having Internet connectivity throughout the day, and all year round. The tools can be used to complement or enable "live course" learning and distance learning (Chan & Robbins, 2006). However, the availability of the tools does not guarantee effective educational learning. As already proposed, the failure of e-Learning systems to capture cultural factors contributes to the inevitable failure of e-Learning systems. This therefore, contributes to the factors that led to the "software crisis." The phrase 'software crisis' harps on the accessibility of such connectivity and Haigh (2010) believes that

software crisis was coined in 1968 at North Atlantic Treaty Organisation (NATO) Conference on Software Engineering in Garmisch, Germany.

It was coined "software crisis" (SC) as a result of the incapacity to construct large software applications, lack of proper budget planning and execution, low productivity, lack of quality in the software and inability to meet users' expectations (Colburn, Hsieh, Kehrt & Kimball, 2008). To date copious research has been conducted on the causes, effects and solutions to the crisis to no avail in the development including e-Learning systems. Cultural considerations could help to design and implement customised e-Learning systems for the right people. Some of the problems identified in 1968 have been already solved because of the improvement in technology and development procedures. In spite of the sophisticated and interactive graphic users interface, a lot is still missing because end-users' cultural and local language content and icons and symbols are not incorporated into the systems. For this reason, the software crisis is not yet resolved: the e-Learning system lacks cultural specificity. Culture-oriented models (Olaniran, 2009; Mayes & de Freitas, 2004) and frameworks (Mohammed & Mohan, 2011) are urgently required to address the software crisis discussed in the preceding segments.

Many research projects are done to meet market needs (Mavetera, 2011). In meeting market needs, quicker approaches, methodologies, models and frameworks are used and some loopholes are left in the systemic context for execution. This study focuses on learner's culture and how cultural factors are captured in e-Learning systems development. The capture of these cultural configurations seek to address the crisis in the lack of culture-oriented e-Learning systems development. This study also helps to add knowledge to the academic field (see Figure 7.1).

Cultural differences impact upon both positively and negatively on learners' learning styles, processes and performance. For example, learners from "high power distance cultures" are uneasy to call a professor by their first name. Also, learners from "high uncertainty avoidance" cultures are cautious, careful and systematic in resolving problems while low uncertainty learners are comfortable in trial and error and risk-taking behaviours in solving problems (Joy & Kolb, 2009). The e-Learning system has been on the market for some time now and could continue to exist, and end-users needs and expectations are only considered to a certain extent. According to Lephalala and Makoe (2012), culture and its constructs need to be taken into consideration during this system development. This is the centre point of this study.

1.5. PROBLEM STATEMENT

End-user satisfaction is an important aspect in developing and determining the success of e-Learning systems and any other systems (Sun, Tsai, Finger, Chen & Yeh, 2008). A learner's actions and attitudes towards ICT determine their satisfaction with e-Learning and these are influenced by Hofstede's cultural dimensions (Power Distance, Individualism/Collectivism, Uncertainty/Avoidance, Masculinity/Femininity, Long-term orientation and Indulgence/Restraint). Meanwhile, there are many other online literature studies, but most of them are based on organisational, national and group culture as proposed by Hofstede (Hofstede, 1980; Iivari, 2005; Myers & Tan, 2003; Kummer et al., 2012; Yeo, 2002; Huang & Trauth, 2007). All the literature mentioned above deal with the roles of culture in information systems design and management but no part of the literature above captures specific cultural attributes (Kummer et al., 2012). Educators are challenged in catering for students from different cultures (Joy & Kolb, 2009; Salmon, 2005).

According to Olaniran (2009), universal e-Learning system lacks robust culture-orientation. This paucity can be seen as a crisis. Moreover, software crisis is still a worrying issue in the field of system development. Haigh (2010) identifies that the questions that most researchers ask themselves are as follows: is e-Learning system design wrong? Do e-Learning developers ignore influencing factors during the systems development? There is nothing wrong with the first question, but the second question shows that something is missing and that is what this study aims to address. The reason is that many characteristics exist among students who come from different cultures and countries as seen in SA. According to Boondao et al. (2009), little research has been conducted on the influence of ethnicity and culture on e-Learning system. The consideration of culture in e-Learning systems development is very important in designing systems that cater for all students from different cultural backgrounds (Boondao et al., 2009; Leidner & Kayworth, 2006; King & Kimble, 2004).

Furthermore, research suggests that many Higher Education Institutions (HEI) are challenged in attracting many students and teachers who ought to be using e-Learning (Salmon, 2005). The challenges are in the area of content acquisition, low-income students, outdated technology, unfulfilled teacher development, social, cultural and economic obstacles, lack of student support and institutional constraints (Ebrahim, 2009; California County Superintendents Educational Services Association (CCSESA), 2011). Critics believe that present research has failed to resolve the HEI problems (Salmon, 2005). This creates room for an additional model and framework to show "transferability and scalability" and engaging e-

Learning systems (Salmon, 2005) where software designers need to capture and incorporate different user needs and expectations (King & Kimble, 2004).

Again, another common challenge of e-Learning system globally is language differences and this is a barrier because most e-Learning content is written in English (Olaniran, 2009). The English content discourages non-English speaking learners from using these e-Learning tools. However, in a situation where learners speak English as a second language, the content is restricted to a specific area. According to Olaniran (2009), it was reported that learning in a second language at school is different from learning in English as a first language. Olaniran (2009) proceeds and states that 40% of online users prefer content in a language that is not English. Language, one contends, is the one most significant of the attributes of culture.

This shows that culture and its attributes impact upon and reshape societal values and determine how individuals and organisations think, feel and behave (Al-Tarawneh, 2012). In the learning space, e-Learning set-up is increasingly getting a recognisable footprint nowadays as a result of increase in mobile devices and other device access to the Internet (Mohammed & Mohan, 2011). According to Mohammed and Mohan (2011), e-Learning system and its contents were originally developed without being culture-oriented. An example is the Hofstede (1980) dimension which shows the role of culture in IS but not how to represent learner's culture in e-Learning system design (Kummer et al., 2012; Fawareh, 2013). The omission and negligence of how to represent culture on e-Learning systems can hamper e-Learning development. From the pedagogic model, culture is placed within the ethical component in the framework features (Zualkernan, 2006), which shows negligence in the development and becomes experienced as a major problem.

Culture can then be influential on both the individual and the collective (Mohammed & Mohan, 2011). Individual cultures are made up of cultural knowledge acquired individually. In contrast, collective cultures are grouped customs, usage, artistic, intellectual and religious formats that influence and define the group or society (Mohammed & Mohan, 2011). Individual culture is framed by interests, beliefs, inclinations and misconceptions, while collective cultures are dependent on tribal identity, societal values, norms, local, regional and geographic locations (Mohammed & Mohan, 2011). This means that culture can directly or indirectly impact upon on learner(s) learning styles and choice of whether to use e-Learning tools or not. This influence can be effectively represented and managed through e-LSDF.

Although South Africa's learning platform as a context of this study is culturally diverse, culture can positively or negatively impact upon the e-Learning educational space. Presently, cultural considerations in setting-up e-Learning systems from the start have not been made largely because of lack of framework and methodology (Mohammed & Mohan, 2011). Again, in accordance with Ngugi et al. (2007), the challenges confronting online learning materials and environment are in the area of catering for students across different societies and cultures. Addressing this challenge shows a development from technological contents to active e-Learning platforms and the development of e-Learning frameworks that cater for diverse cultures in SA. But the reverse is the case as cultural influence and impact upon have been ignored by e-Learning promoters (Mohammed & Mohan, 2011). This study develops a culture-oriented e-Learning framework to include individual and collective cultures in e-Learning systems development (see Figure 7.1). At this point, there is a crisis in the overall development of e-Learning system and a problem that results in the non-integration of learners' cultures in the development of the system. Also, the crisis has resulted in the problem of lack of frameworks that guide developers of e-Learning systems. In the pursuit to resolve this gap, "Seven cycle culture-oriented e-Learning system framework" (SCCOe-LSF) (see Figure 7.1) was developed to tackle the challenges and problems identified and highlighted in the preceding segments.

1.6. RESEARCH QUESTIONS

The primary research question is,

- ✓ What are the cultural factors that should be considered when designing an e-Learning System (e-LS)? This question seeks to understand cultural issues to be considered in e-Learning system development.

The secondary research questions are divided into two categories. The first category is aimed to gather data from the e-Learning developers while the second category focuses on the students in this study.

First category research questions are:

- ✓ How do cultural differences impact upon e-Learning system design and implementation in SA? From the problem statement, different cultures exist among the users of the e-Learning system; therefore the question seeks to understand how the cultural difference impact upon the design.

- ✓ How is culture captured in the development of e-Learning system? Capturing of culture is a challenge as identified in the problem statement, and therefore the question aims to understand how this culture fits into e-Learning development
- ✓ What are the challenges faced in the development of e-Learning systems? The software crisis is an existing challenge in the field of software development. This question seeks to understand the challenges faced by respondents in the study in developing e-Learning systems.

Second category research questions are:

- ✓ What are the challenges facing the current e-Learning system? The design, implementation and usage of e-Learning is confronted with different challenges and issues which result in ineffective optimisation of e-Learning potential benefits. This question seeks to understand the real challenges students face in using e-Learning systems.
- ✓ How can culture-oriented e-Learning systems be implemented to assist learners better? The alignment of e-Learning with cultures remains challenging: this question seeks to understand from learners how their cultures could be represented on the e-Learning systems developed.

1.6.1. The hypothesis in quantitative data

The development of culture-oriented e-Learning systems remains an issue of concern in accordance with literature studies; then, correlation and chi-squared analysis were done to ensure the research questions responded to the research objectives. A hypothesis can be regarded as a statement that shows a probable relationship between a dependent and independent variable. In this study, a hypothesis was used to test the relationship between variables. The relationship test was done through chi-square to establish if two randomly related variables can produce the same pattern. The output was in the form of a culture-oriented e-Learning System Development Framework (e-LSDF) to be used in higher education institutions. Based on this rationale, the researcher used chi-square to understand the impact of culture on e-Learning systems and how to execute culture-oriented e-Learning systems that can accommodate learners from different cultural backgrounds. The hypothesis questions are fully presented in Table 6.9 to Table 6.19 in Chapter six (6).

1.7. RESEARCH OBJECTIVES

The sharing and accessibility of information and knowledge are a universal need (Mavetera, 2011) in a quest for information and knowledge at convenience. System development

methodologies make it easier in capturing learners' learning requirements and making e-Learning systems user-friendly. As stated in the problem statement, the research objectives centre around culture-oriented e-Learning systems. The earlier statement shows that systems are designed based on developers cultural factors while the learners own are ignored and the Hofstede dimension and other framework (Georgouli et al. (2008) and Blanchard et al. (2005)) on culture are only based on the role of culture in IS design. Nevertheless, e-Learning discussion should be treated with sensitivity (Kummer et al., 2012) to a given cultural value and understanding the implication of e-Learning with the global education platform. E-Learning tools are increasing globally and this call for a cultural framework like e-LSDF standard in the development process (see Figure 7.1). Negligence of culture in e-Learning SDM brings disadvantages to learners whose cultural values are different from those who create and develop e-Learning contents (Olaniran, 2009). For e-Learning to achieve its mandate and be productive, there is a need for e-LSDF consideration, because of its cultural effect on e-Learning. In achieving the cultural dimension and addressing the problem statement, the following objectives were derived from the problem statement to be achieved in this study:

- ✓ To understand cultural factors that impact upon the design of e-Learning system;
- ✓ To determine how culture is captured and represented in the implementation of e-Learning system in the South African learning space;
- ✓ To investigate SDM that captures culture in e-Learning system development, e-Learning challenges, and
- ✓ To develop e-LSDF that is suitable in different cultural e-Learning environments in SA and possibly elsewhere.

According to Olaniran (2009), lack of culture is the major challenge to e-Learning globally and this could be addressed during e-Learning contents and system development. Furthermore, there is a need to develop an e-Learning framework that will recognise different cultural structures, values and standards. This call is for e-learners, developers and organisational providers to be culture-oriented.

1.8. RESEARCH DESIGN AND METHODOLOGY

Methods are techniques or processes used in research. A methodology is "strategy, plan", setup and design connecting selected methods (Raddon, 2010). For the purpose of this study and achieving the study objectives, this section assists in gathering deep information using the right methods as discussed in this section and in chapter four. The study applied embedded/nested

mixed method in carrying the research paradigm and method mandate (see Chapter three). In addition, the researcher used this design or method to provide a special pathway to handle the data collection, analysis, interpretation and validity in the research (see Chapters five and six).

Research data types can be classified into qualitative, quantitative or mixed research (Bless & Smith, 2000; Oates, 2008; Crittenden, 2006; Richard & Morse, 2007). The selection of any research type is based on the link between the problem under investigation, the problem attributes, researchers' knowledge of the research area, the variables concerned and the purpose of the study; all these impact upon the type of research method chosen (Bless & Smith, 2000). The gathered data on this study helped to understand how higher education institutions in SA have managed cultural diversity in the implementation of a balanced e-Learning system. Nevertheless, this study collected data from the involved higher institutions because of their student lives mixture, social and economic classes. The learner's cultural background and the multinational diversity of the learners.

1.8.1. The study paradigm and methods

Paradigm is the total way of thinking about our world (Oates, 2008). Different researchers in a community of discipline think differently in doing research. There are diverse kinds of paradigm: constructivism, positivism, interpretivism, critical research, positivist, interpretive, objectivism, subjectivism, and pragmatism. Each looks at our world differently. However, the study uses the interpretivism research paradigm.

As a philosophical term, constructive research is a paradigm used to discover social surrounding through "problem-solving", question-driven and solution-driven. It investigates the development process of the social setting and impact upon factors through interpretive. It also tries to understand the social standpoint of people's values and viewpoints attached to their social setting (Oates, 2008).

1.8.2. Data flow

The diagram on Figure 1.1 below shows how the research design is selected for this study and the flow of information from point A to B on data gathering using mixed research approach. However, each part of the research data flow diagram is discussed below.

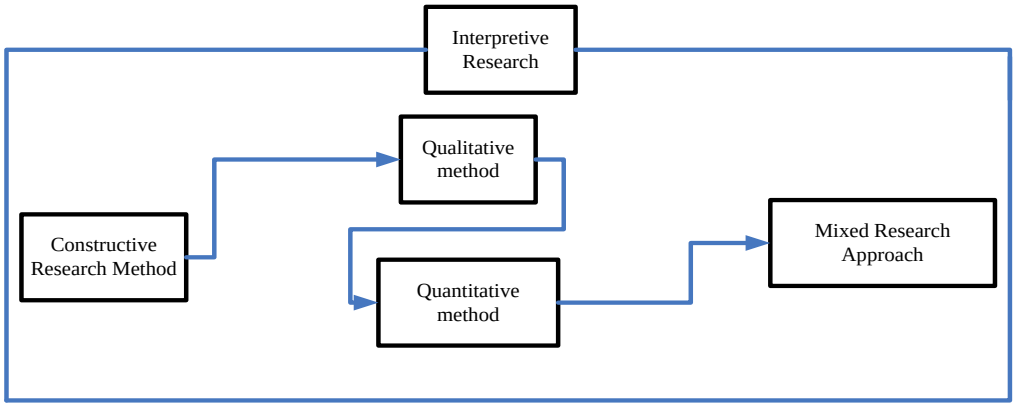


Figure 1.1: Research data flow

Any strategy can use more than one data gathering method. Research strategies contain different strategies like survey, constructive research method, design science, experiment, case study, action research and ethnography. However, the study focuses on constructive research method because of its aim to develop e-Learning system framework. The constructive research method is a research method that shows structural or diagrammatical road-map on how a research problem can be solved (Crnkovic, 2010). The method acts on existing skills and knowledge in advancing and addressing real-life research gap.

The qualitative research approach is carried out using description to explain our world. However, qualitative research approach admits non-numeric data (Bless & Smith, 2000) like images, words, sounds and it can be carried out through an interview, organisational document, researchers jotter and websites (Oates, 2008). According to Patton and Cochran (2002), qualitative research methods are methods that gather word against numbers in data gathering. But they lack rigour, that is, data can be less important from a large population and the finding can be biased as a result of the researchers' influence in data gathering (Bless & Smith, 2000). Qualitative data analysis has less technique and it lies on the researchers' knowledge to understand designs within the data (Oates, 2008). Again, qualitative methods are occupied with words rather than numbers, and one week of field work can result in hundreds of pages of papers (Oates, 2008).

In the qualitative method, according to Bless and Smith (2000) and Oates (2008), words and sentences are commonly used. It involves asking questions. Qualitative research methods are non-systematic in nature (Bless & Smith, 2000; & Oates, 2008) and they commonly gather data through interview or focus groups (Bless & Smith, 2000). Interviews were used for the data collection on qualitative research in this study.

Quantitative research collects data via questionnaire that is based on numbers and scores (Bhattacherjee, 2012) and also focuses on theory-testing. The combination of both research methods takes us to the actual research method used in this study. Mixed research is the integration of qualitative and quantitative research into one research for an in-depth understanding of the phenomenon under study (Wurtz, 2009; Cameron, 2011). So, this study used mixed research methods in order to collect data from education institutions and NWU students and a detailed discussion is provided in chapter four.

Interview: There are different ways of collecting data from research participants including an interview (Bless & Smith, 2000). This study deploys interview (structured) as a data collection method. An interview is a "direct personal contact" data collection method from participants who are asked questions relating to the research problem (Bless & Smith, 2000). According to Rosenblatt (2014), an interview is an arranged meeting aimed to get information from participants in the fact-finding phase of research. This can be achieved through structured or unstructured interviews where people express their opinions generally on defined matters. The interviewed can expand the question topic freely. Any interviewee can seek for clarity on a given question, but direction is not given and no time limit is given on any question (Bless & Smith, 2000).

There are seven steps that should be followed while conducting the interview; the steps are listed below. The diagram shows the structure of the different steps of the interview.

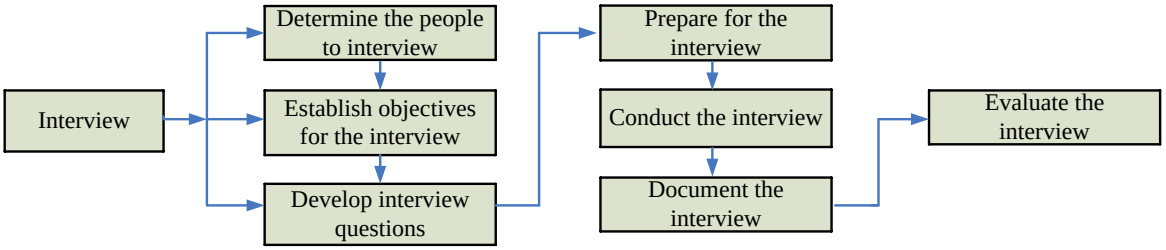


Figure 1.2: Interview process ***(adapted from Rosenblatt, 2014)***

To conduct an effective interview, proper planning needs to be carried out with the following steps and processes to be followed (Rosenblatt, 2014): **(1) Determine the people to interview:** right participants for the interview should be selected with the right questions. **(2) Establish the objective for the interview:** Specific objective of the interview and area of interest must be identified and listed out. **(3) Develop interview question:** Well-structured questions should be framed in order to assist the interviewer to remain on track in the process. At this level, the questions can be open-ended questions (interviewees are allowed to express their views outside

the listed questions), closed-ended questions (interviewees are restricted to a certain list of questions at hand).

(4) Prepare for the interview: The interview must be prepared taking into consideration the interview time, letting the interviewee know the duration of the interview, the venue, the date, possibly through, email. The interview is not causal meeting for a chat. **(5) Conduct the interview:** The interview process begins with a personal introduction, project description, interview objectives, after which questions is asked as arranged. Interviewees should be given enough time to think before responding to each question and a good rapport is needed in the process. **(6) Document the interview:** Note taking is necessary during the interview but with advantages and disadvantages, only important things said should be noted down and be kept to a minimum. The report shows that 50 percent of conversations are forgotten after 30 minutes. **(7) Evaluating the interview:** All bias should be identified, for example, the interviewee might be shy or trying to protect his or her personal image/information or give wrong information.

Nevertheless, there are different kinds of interviews such as a structured, semi-structured and unstructured interview. This study uses the structured interview.

Structured interview: This is a direct method of getting data from participants (Bless & Smith, 2000). The research questions are fixed and sequential in wording and presentation. The questions are presented by the interviewer as pre-set so that the interviewee will not influence the process. The questions must satisfy the following standards (1) the questions are pre-set and (2) the questions can be used without direct contact with the participant through self-administered questionnaires and the questionnaires are completed without the researcher's influence or assistance (Bless & Smith, 2000).

Complexity can arise as a result of the variety of answers from different people. An interview can be time-consuming and expensive, but better techniques to minimise associated cost include the use of telephone interview (Bless & Smith, 2000). This method can be used to minimize cost. However, the research method to be used in this study is qualitative data analysis. The study gathered sample data from NWU, Wits and UCT via interview. The framework and methodology was developed to include culture and its factors in the development of e-Learning systems in SA.

Questionnaire: The questionnaire is widely used to collect quantifiable data (Oates, 2008). It can also be seen as a prewritten order of questions to provide information on a phenomenon (Kothari, 1985; Chukwuere, 2013). It is a pre-set question that respondents have to answer, the

respondent reads and replies as needed (Kothari, 1985; Degu & Yigzaw, 2006). Nonetheless, there are two main types of questionnaires open and closed-ended and a combination of both (Kothari, 1985; David & Sutton, 2004).

For the purpose of this study, closed-ended questions were used in gathering data from NWU students for their knowledge in using e-Learning systems on daily basis. The questions were arranged in the form of multiple choice and participants were allowed to select their answers from the options provided, in order to get quantifiable data to support data gathered from the interview.

1.8.3. Ethical considerations

This study has no ethical bias or violation, but ethical clearance letter was obtained from the Ethics Committee of NWU before the interviews and questionnaires data collection were conducted. All the work in this thesis belongs to the researcher and all consulted materials as secondary sources are acknowledged.

1.8.4. Representative sampling

The data for this study was gathered through interviews and questionnaire while secondary data came from the literature study. The selection of data sample was done with sensitivity and systematically so that the sample could be credible (Patton & Cochran, 2002). Mixed method was found suitable for data gathering in this study because of the selected participants' extensive knowledge of the phenomenon under investigation and the fact that useful information data could be generated from them (Patton & Cochran, 2002).

To verify the credibility of the sample and the correctness of the participants selected, a maximum variation sample strategy was used. A selection sample population cannot represent the entire population and the claim cannot be verified. A sample size can be little in a research method (Patton & Cochran, 2002) and this is the basis for the selection of mixed research method for this study. To determine the sample size is to continue interviewing respondents till no new data is forthcoming and this section is called saturation (Patton & Cochran, 2002). According to Patton and Cochran (2002), a sample size of 50-60 participants in a questionnaire, amount to 3 to 5 participants (people) when using the interview.

1.8.5. Data analysis

In analysing mixed data, there are different software tools that can be used like the Statistical Analysis System (SAS version 9.3), Statistical Package for the Social Sciences (SPSS), Atlas.ti and Microsoft Excel. In using some of these tools in a textual qualitative data analysis on like

text: search (using phrase or word to find a text), coding (allowing one to employ personal coding building block of text), data organisation (enables one to form personal file of data), writing tools (allow one to jot or write down his own notes or memos), visual displays (to coordinate or gather segmented data gathered) and exporting (enables one to integrate data to other software tools) (Oates, 2008). The Atlas.ti tool helped in analysing audio, video tape and image in a qualitative research, the tools are:

- ✓ Transcript creation (transfer audio to text document),
- ✓ Coding (allows the attachment of personal codes or text to audio or video clips),
- ✓ Data organisation (assists in arranging audio and video digitally) and
- ✓ Hyperlink creation (allows linking of segmented media type) (Oates, 2008).

In analysing the quantitative data, Microsoft Excel, SPSS and SAS 9.3 software was used in this study. To draw the contents, Atlas.it was deployed in extracting the important elements from the group of words for coding. However, the content analysis method was used to complement used software's; content analysis is a "systematic and objective means" to explain the meaning of a phenomenon (Elo & Kyngas, 2008: 108).

1.9. BRIEF LITERATURE SURVEY

In recent times, a call on what is called "status reports" on the growth of ICT learning (education) in the South African context was made (Ngugi et al., 2007). The call was based on the 2004 white paper on e-education published by the National Department of Education (DOE) termed "together a think tank in 2006" on the need for the implementation of e-Learning in schools (Ngugi et al., 2007). According to ICTS and Higher Education in Africa (2007), many kinds of research have been published like "Education as change" published in December 2005. Perspectives in Education published a special paper in December 2005 titled, "Research on ICTs and Education in South Africa". The South African Journal on Higher Education published a special edition presented at the National Association of Distance Education and Open Learning in South Africa (NADEOSA), 2006 conference with focus on ICTs in education (Ngugi et al., 2007).

All these publications and many more are asking the same question on where South African e-Learning is heading to, realising that many universities and other higher education institutions have plenty of computer-based systems with internet connectivity which is influential in the educational setting in the country (Ngugi et al., 2007). The Council on Higher Education Sector

has provided the nature of ICT utilisation stand in South African universities. All these publications have no place for culture capturing in e-Learning (Olaniran, 2009).

By definition, e-Learning is the capability of learning through ICT components, tools and applications like internet connectivity, software, CD-ROM, electronic media and telecommunication (Ngugi et al., 2007; Blanchard et al., 2005; Oyelami, 2008). According to Ngugi et al. (2007), the literature available shows that the execution of e-Learning tools in education institutions differs. This difference can be the result of individual, organisational, societal cultures, approaches and learners' (students) learning communities. Research shows that web-supplemented (widely used), web-dependent and other online courses are a range of activities performed by SA universities online (Ngugi et al., 2007).

1.9.1. E-Learning systems

The growth rate of e-Learning has reached 35.6%, but challenges occur (Sun et al., 2008). E-Learning is a consistent teaching and learning via the Internet; it is an increasing process these days in education systems (Blanchard et al., 2005). Higher bandwidth, lower internet tariff and computer cost and an increase in computer literacy make access to learning materials easy and more accessible. E-Learning has a positive new, easy accessibility to information anytime, anywhere allowing learners from all continents of the world to learn and share information synchronously (Blanchard et al., 2005). It shows globally that learners can access same learning material and content systematically. E-Learning cannot operate without an educational platform and internet network. Traditional (classroom) learning is subject to boundaries, but e-Learning is borderless (Olaniran, 2009). Knowledge and ideas can be shared and disseminated globally and easily as a result of e-Learning in conjunction with the Internet (Olaniran, 2009). However, e-Learning has a negative and challenging end, the implementation comprising hardware and software and training cost can be high and inclusion of learner's culture. Copyright infringement increases and gives room to a virus and other security threats (Nayak & Suesaowaluk, 2007). Again, according to Nedeva, Dimova & Dineva (2010), it limits "barriers to access" because only limited students can use the resources online; it also lacks customization and motivation. Sometimes, the communication medium may not suit students' needs, like the video/ audiotape sounds not clear enough and many more.

Internet transformation is increasing e-Learning space day-by-day (Oye, Sallah & Iahad, 2012). In the learning environment, the definition of e-Learning is based on expectation and outcome and this can be related to distance and online learning (Moore, Dickson-Deane & Galyen,

2011). In accordance with Moore et al. (2011) and Oye et al. (2012), e-Learning has different a definition and terminologies and researchers have not agreed upon a single definition. Some higher education systems do not deliver distance education through cutting-edge technology media while also on e-Learning. The term e-Learning and distance education do not correspond with each other (Guri-Rosenblit, 2005).

Distance education can be traced back two centuries ago showing changes in a learning platform and new ways of communication (Moore et al., 2011). Before now, the way information and ideas were communicated has been via 'postal service'. Presently, a different communication method has emerged. Online learning first emerged in the 1980's, however, e-Learning root is yet unknown (Moore et al., 2011). Lately, the increase has doubled as a result of different forms of learning technologies and multi-media, but the fact remains that researchers and practitioners have no common definition of e-Learning (Mavetera, 2011). The definition of e-Learning is still conflicting. Some researchers define it as learning access through technology tools like 'web-distributed, web-based, Internet or web-capable'. The learning is not only based or delivered through CD-ROM, intranet or Internet, but it involves satellite broadcast, audio and videotape, interactive TV and others (Moore et al., 2011).

Different modes of technologies network and computers can be applied by a learner to access learning materials. According to Oyelami (2008), materials like CD-ROM, email, website, audio and video tape, video conferencing and many other delivering methods are used through ICT to deliver e-Learning content. Furthermore, applications like the virtual classroom, computer-based learning, digital (collaboration) partnership and web-based tools are used to convey knowledge (Oyelami, 2008).

However, some researchers define e-Learning as a "constructivist theoretical model" for framework constructive process or as an online learning associate (Moore et al., 2011). E-Learning can be defined also as a 'borderless computer-generated learning using multimedia technologies'. Effectively, e-Learning ensures knowledge building out and within the organisational world. It deals with the what, how and why training and learning are delivered digital(ly) (Clark, 2002). With e-Learning, information and knowledge are driven out of the personal zone (Carabaneanu, Trandatir & Mierlus-Mazilu, 2006). E-Learning definition could be conflicting, but common characteristics exist in the definitions. This study bases its definition on Olaniran and comes with its own as; e-Learning is the use of technological medium positively to impact upon teaching and learning in a framed platform. In order to

implement interactive and user-friendly e-Learning systems, the framework as a guide is crucial and achievable through e-LSDF. However, e-Learning aims to provide effective and efficient learning environment and improving teaching and learning.

1.9.2. System Development Methodologies (SDM)

The development of quality e-Learning systems demands a System Development Methodology (SDM) which is a process of analysing, designing and developing quality information systems (Singh & Kotzé, 2003). A methodology can be seen as a viewpoint or 'philosophical framework' which formulates the development model (Tatnall & Gilding, 1999). Methodologies provide 'technical infrastructure' for knowledge and information delivery. Current transformation in academic organisations increases in e-Learning tools and usage and is believed to be doubled soon in the near future (Oye et al., 2012). Still, e-Learning software tools should provide flexible guide and instruction, 'planning, analysis, design, documentation, implementation and deployment, support and security' and interface to the usage (Oye et al., 2012). All these guides should be facilitated through SDM.

The process of analysing, designing and developing quality information systems is the sole aim of SDM (Singh & Kotzé, 2003). The structure used in software development is called software development methodology (SDM) (Faridani, 2011). The structure involves techniques, procedures, tools, methods and documentation; all these assist developers to execute workable systems. The methodology also aims at making the development process repeatable and shareable (Faridani, 2011). The past decades have seen the emergence of different frameworks and methodologies, with many being similar in content and procedure, but some are contradicting. All these are aimed at minimizing or reducing software crisis in system development. However, the big question remains, which methodology can be suitable for a given project and how can it be known?

According to Faridani (2011) Standish group research 2009, only 32% are delivered on time, and on a budget, 44% are delivered late, over budget, 24% are cancelled or failed before completion. Again, Forrester research group (Hoffman, 2003), 'approximately one-third (1/3) of all IT projects launched on average would be three months late'. Most of the time, the failure is because of wrong choice of methodology or not using methodology at all (Faridani, 2011).

Research revealed that 'three-quarters of IT projects produced in the last seven years' are challenged in different ways like complete failure, overrun cost, or not meeting user's expectation. Present software development codes are written with debugged "code-and-fix

model" (Faridani, 2011). Heavy methodologies are structured approaches built with paradigms like a waterfall, and spiral. While agile is an example of lightweight methodologies reviewing scrum and extreme programming (XP) which is classical, iterative in a process. However, methodology aims to change risk assessment and resolution (Faridani, 2011). A paradigm can be seen as a systematic or unique assumption engaged in by expert or classical body that enables members to collaborate, share same ideas and similarity and how to acquire and implement it. "Ethnomethodological" researchers have revealed that such assumptions can be used by the entire body (Hirschheim & Klein, 1989). This study explains SDM as a systematic process of development of a system (e-Learning system). However, this model is explored in a separate chapter.

1.10. SIGNIFICANCE OF THIS STUDY

In education, technology has become a crucial tool. Computer-Based Technology (CBT) brings a positive increasing knowledge sharing and information. Software crisis remains an issue in the software development industry. The multi-cultural setup of e-Learning system demands for a new methodology (framework) paradigm that will unite cultures and unique differences across learners in learning (AL-Hunaiyyan, Al-Huwail & Al-Sharhan, 2008).

Learner's drop-out of education is on-going in spite of the existence of e-Learning. This study hopes to formulate e-LSDF which can be used in capturing cultural deviation in society during the e-Learning system development phase. Earlier, e-Learning aimed at supporting and representing classroom-based teaching and learning online (Internet), but nowadays, it tries to establish virtual classrooms (Singh, 2003). The first generation of e-Learning provided a single instruction mode while the second provided combined instruction mode when properly delivered, giving more choices effectively (Singh 2003). However, the proposed e-LSDF includes individual and collective culture in e-Learning systems development domain as stated earlier.

In reality, learners' (individuals) choice and expectation varies, hence organisations and individual developers must embrace e-LSDF approach and strategy that aims to satisfy different sections of the cultural background. In an attempt to achieve this, e-LSDF acts as a mechanism that assists developers in managing cultural differences. While developing e-Learning system/tools that are cultural, divers and friendly at all levels of society in South Africa and beyond and adding knowledge to academic body.

1.11. LIMITATIONS OF THIS STUDY

For a quality research work to be done in meeting validity and reliability, this study is limited to Wits, NWU and UCT as noted earlier (see Section 1.1). Wits is located in Johannesburg SA with over 32,535 students coming throughout the socioeconomic scale of South Africa and the African continent (Wits, 2016). Making it SA and African transformative university. While the University of Cape (UCT) was found in 1829, situated in Cape Town, SA and housing staff and students from over 100 countries in Africa and around the globe. Statistics shows that UCT have a total of 26,322 students and 4200 of this number are international student coming from different nations of the world (UCT, 2016).

NWU is an institution in two provinces of SA. The Potchefstroom and Mafikeng campuses are situated in North-West Province and Vaal Triangle is based in Gauteng. In order for NWU to remain effective and innovative in teaching and learning, eFundi and other learning portals are used to impact upon positively teaching and learning virtually across the other institutions in this study. Moreover, eFundi is e-Learning platform used to aid teaching and learning across NWU campuses. The unique thing about these institutions is that they are multicultural and multinational housing hundreds and thousands of students across SA and globally. Also, they uses e-Learning systems to aid teaching and learning at their institutions. Then, this study focus on these education institutions as result of their global presence and the researcher's ability to have access to data in carrying out the study.

1.11.1. What this study is not

IS research is mandated to generate ideas and knowledge on "know-how" that can assist in analysis, design, implementation and development of business solutions (Mavetera, 2011). Generated knowledge can assist to add to or resolve existing challenges. But there are two main research parts that guide IS research: "behavioural and natural science". Behavioural research dwells more on factors that influence human behaviours, while natural scientific research leans more on natural factors. The development and theories of justification, and forecast are all aspects of behavioural research. Design scientists emerge from behavioural and the natural sciences. The combined knowledge between behavioural and natural science aims to enhance 'human behaviour' (Mavetera, 2011). Design science aims to implement strong artefact in a model form. Basically, design science is mandated to advance artefact work standard and performance and understanding, a consequence as any other mandate.

The understanding of different research types ensure clarifications in the study but this study focuses on constructive research approach (CRA). Nonetheless, other issues are discussed in this study which may not be the focus point of the study. In spite of extensive courage of the study, it may not solely cover the followings:

- ✓ It does not develop e-Learning system or prototype.
- ✓ This study does not discuss or focus on things not included in the document like other kinds of e-Learning theories.
- ✓ This study does not test or state how Hofstede's dimensions can be apply on e-Learning system design.
- ✓ It does not cover or check individual or corporate e-Learning system standard or structure.
- ✓ This study does not develop e-Learning policy.
- ✓ This study does not test or measure learners' feelings as part of cultural attributes.
- ✓ The investigation is limited to what is discussed in this study.
- ✓ This study does not conduct or gather data from institutions not mentioned in the study.

Rather, this research formulates a framework that acts as a guide for the development in capturing learners' culture in developing e-Learning system.

1.11.2. Validity and reliability

In the past, validity and reliability were commonly used in quantitative research but presently it is also used in qualitative research paradigm (Golafshani, 2003). Validity and reliability can be used to test qualitative research to achieve rigour in research, and rigour depends on reliability and validity (Bashir, Afzal & Azeem, 2008). According to Chukwuere (2013), validity research is important in a discipline and reliability improves generally acceptable research (Bashir et al., 2008). Both validity and reliability can be applied in this study to ensure rigour, quality and objectives are achievable, and acceptance in IS discipline. Also, the area of usability, repeatability, trustworthiness, credibility and many others are implemented in this study. This study ensures validity and reliability as discussed below.

Validity: It determines whether a study measures what it aims to measure and how true the measurements are, or it ensures if the instrument used captures the objectives (Golafshani, 2003). To achieve validity, questions are asked and answers are given, however, the above definition is commonly rooted in quantitative research paradigm.

In a mixed method research (MMR), validity is used in different ways. The definition is not static or globally acceptable, but is focused on processes and targeted research methodologies,

but some disagree on the needs for validity in qualitative research paradigm (Golafshani, 2003; Bashir et al., 2008) and others state that validity is a good measurement and quality check in a mixed research (Golafshani, 2003). Bashir et al. (2008) agree that credibility, plausibility and trustworthiness constitute the definition of validity in qualitative, mixed research paradigm and validity can be used to achieve credible research.

Reliability: It is the way to ensure that research results can be consistent in the long-run and correct demonstration of the use of the study population under investigation ensuring the accuracy of the related methodology used. In the end, it can be said that the used instrument is reliable (Golafshani, 2003; Bashir et al., 2008). Reliability also ensures results reusability, repeatability and replicability. However, according to Golafshani (2003) and Bashir et al (2008), the credibility of qualitative research is based on the researchers' effort and ability, but validity and reliability are separately dealt with.

The following terms, "credibility, transferability, and trustworthiness", are used as illustration of reliability and validity in qualitative research paradigm (Golafshani, 2003). Research shows that quality is the term used in reliability and validity in qualitative research paradigm and "credibility, neutrality or confirmability, consistency or dependability and applicability or transferability" are quality terms used in the paradigm. However, "dependability" is used for reliability in qualitative research (Golafshani, 2003; Bashir et al., 2008).

Dependability tests the consistency or reliability of the research process and results across the period; to achieve consistency, process and product reduction are monitored. Reliability in a mixed research paradigm is centred on trustworthiness and some researchers believe that reliability is less-important in qualitative research paradigm while others see reliability as the effects of validity (Golafshani, 2003; Bashir et al., 2008). To achieve reliability and validity in this study, interview and questionnaire were used as primary data source, accredited journal articles and textbooks were used for secondary data. According to Sarantakos (1998), to achieve validity, appropriate method of gathering data, measures and suitable communication techniques must be used. Achieving reliability also allows the limitation of interference from the researcher. All these were followed in this study to ensure validity and reliability in general (see Section 7.7).

1.12. STUDY LAYOUT

This study is divided into seven (7) chapters which are as follows:

- ✓ **Chapter one:** Introduction to the study – The chapter opens up the study topic and clarifies all influential components of the study.
- ✓ **Chapter two:** The chapter deals with literature study on Systems Development Methodologies, Approaches and Models (SDMAM'S) and e-Learning and their contributions to this study.
- ✓ **Chapter three:** The Conceptual Framework deals with Constructive Research Approach (CRA) - The chapter provides the constructed ideas involving real-life issues in the e-Learning system development.
- ✓ **Chapter four:** Research Methodology – The chapter lays out the methodology used in this study.
- ✓ **Chapter five:** Qualitative analysis and discussion of findings: The chapter covers data extraction and translation of data into meaningful information that is ultimately presented qualitatively.
- ✓ **Chapter six:** Quantitative analysis and discussion of findings: This presents and covers the quantitative part of the study.
- ✓ **Chapter seven:** The research conclusions and recommendations for future study: This segment of the study covers the overall summary of the entire study as well as providing recommendations to developers and other stakeholders.

1.13. CHAPTER SUMMARY

Culture impact upon how people use and value communication media, especially in a virtual-classroom. Cultural differences should be considered when developing or integrating and making choices involving technology and media. The roles of culture in e-Learning in SA cannot be ignored in the development of e-Learning systems. e-LSDF is necessary and at the heart of SA e-Learning growth. In sum, the potential benefits of e-Learning on the higher education platform across SA have not yet been fully explored. The reason is the limitation in resources and large numbers of student communities that have no access to ICTs. Challenges exist, but institutions have tried building ICTs capacities and technologies and skills that enable access to technological tools. The first step in achieving effective e-Learning environment is to increase access to computer systems and internet connections, effective system support, infrastructural development, ICT training for staff and students. Indications show that

telecommunication technologies in SA and levels of access are constrained hence the dire need to bridge the digital divide between learned and unlearned, poor and rich, rural and urban, through the establishment of ICT infrastructure.

CHAPTER TWO

SYSTEMS DEVELOPMENT METHODOLOGIES, APPROACHES AND MODEL (SDMAM'S)

2.1. INTRODUCTION

The previous chapter dealt with the introductory section of the study, introducing the research problem and highlighting the purpose and objectives of this study. This chapter discusses Systems Development Methodologies (SDMs), Systems Development Approaches (SDA) and Systems Development Model (SDML), e-Learning theories section (A and B) respectively, the conceptual matrix and theoretical grounding of the study.

Section A presents how an e-Learning system is designed and executed using different development methodologies, approaches and models. The development and implementation of e-Learning cannot be done overnight; rather, steps and protocols must be followed. SDM can be seen as the pedal for e-Learning system design and execution. Some of these methodologies are generic while others are specific. Most of them can be applied in e-Learning system development, but the choice on a preferred one depends on the developer's knowledge, budget, the timing, expected users and existing environment. However, these methodologies, approaches and models have one thing in common among them. They have failed to recognise or provide the processes to capture learners' culture in the development of e-Learning system, although, nonetheless, each of them is flexible enough to partner with the proposed framework in this study to achieve culture-oriented e-Learning system.

Section B presents e-Learning and other components that relate to e-Learning. All these e-Learning platforms can be regarded as the final fruit of effective and efficient use of SDM which converts the development process into an e-Learning system (software project). The conceptual matrix provides a detailed summary of these methodologies, approaches and models. The summary shows their gaps, while the theoretical grounding shows the philosophical standard that details the knowledge (epistemology), cultural (heuristic), and ontological and conceptual framework of this study. The diagram in Figure 2.1 shows the structure of the chapter. The chapter begins with the Figure 2.1 and other headings and sub-headings follow.

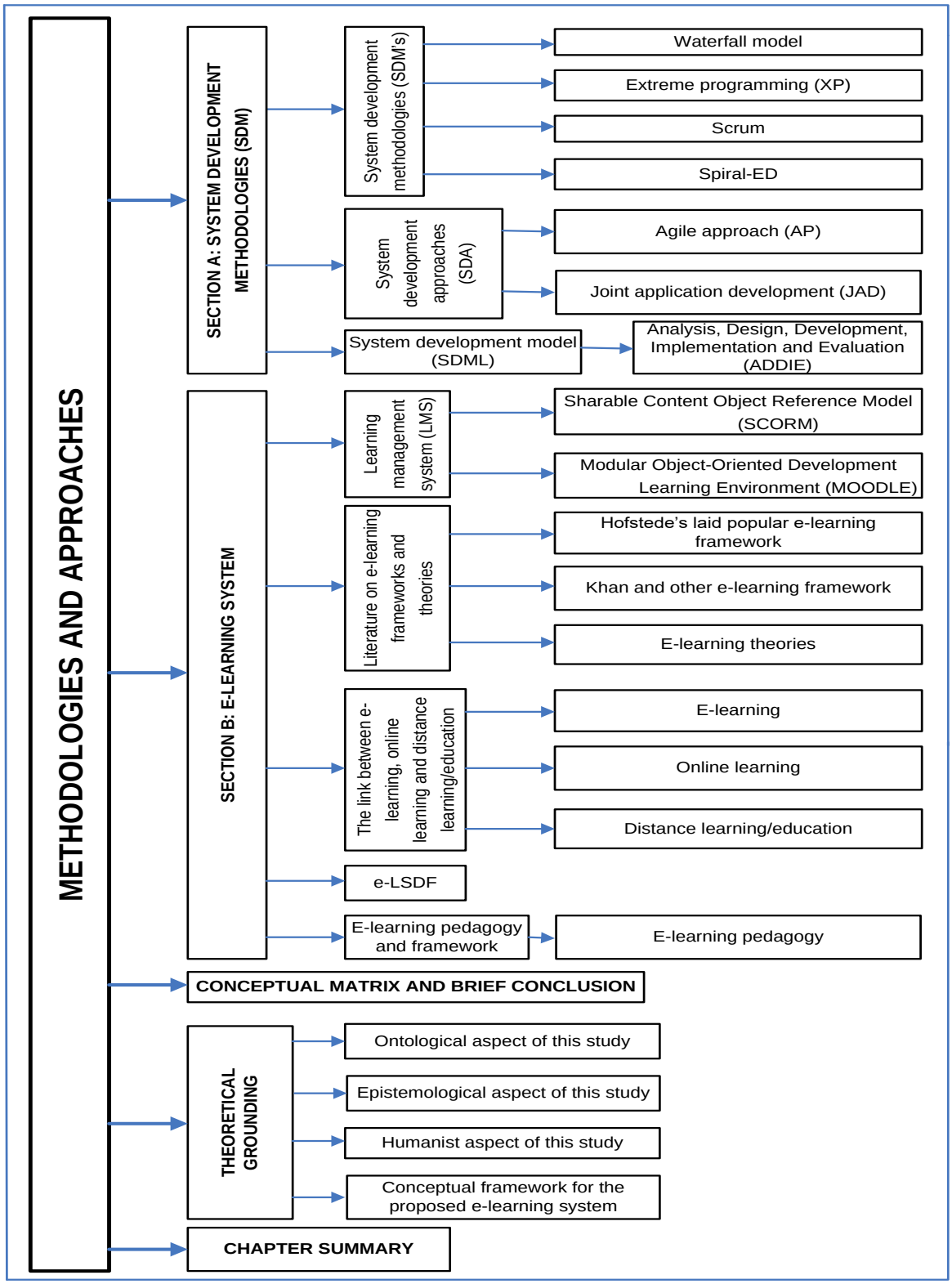


Figure 2.1: chapter structure

2.2. SECTION A: SYSTEMS DEVELOPMENT METHODOLOGIES, APPROACHES AND MODEL (SDMAM's).

This section of the chapter presents the methodologies, approaches and models used in the development of software projects and serves as a yardstick for the other section in this study. The development processes involve the use of System Development Life Cycle (SDLC) or SDM. SDLC or SDM is a formation model used in the development of the software product model (Schinckus, Wautelet & Kolp, 2009; Valacich, George & Hoffer, 2006). But, according to Singh and Kotzé (2003), most of these development methodologies, approaches and models have procedures in common: planning, analysis, design, implementation, deployment and security, testing and support.

2.2.1. Systems development methodologies (SDMs)

SDM can be seen as methodologies used in the development of information systems. According to Mnkandla (2009), methodologies provide detailed information on what should be carried out in every step of system development. But methodologies may not really indicate how many of procedures to take. This section explores some of the methodologies available in the field of Information System Development (ISD) arena which can be applied in e-Learning system development. To be successful, ISD strengths and weaknesses must be identified in an effort to establish effective learning processes for students. E-Learning systems face challenges in systems development in that developers find it very difficult to include learners' cultures and experiences in the design (Calvo, Ellis, Carroll & Markauskaite, 2007; CCSESA, 2011). These challenges are articulated in the problem statement. The foremost objective of this section is to maximise the potential of these methodologies in addressing lack of learners' culture recognition in the development of e-Learning systems (see Section 2.4). The inclusion of learner's culture leads to the design of an innovative and adaptive cultural e-Learning system across-cultures.

Also, SDM is a standard-structured process that guides organisations to carry-out 'analysis, design, implementation, deployment and maintenance of Information Systems (IS)' (Valacich et al., 2006; Mnkandla, 2009). The progression is applied in e-Learning design, through this study and the process begins with analysis in which e-LSDF is well integrated into the development process. The great impact of SE in the modern educational development process is felt and depicted as being an on-coming discipline. Education systems can be tested in a strong methodology that supports real-life evidence, but students with good approach to

learning technology perform well and vice versa (Calvo et al., 2007). However, methodologies reusability impact upon the development, and the e-Learning development is based on the adoption of the process for suitability design (Arman, 2010). In accordance with Singh and Kotzé (2003), software methodologies aim to design and develop effective, efficient and workable IS's. A workable system or application is just serving objectives, but ability to reflect on user's social context also matters.

But, according to Singh and Kotzé (2003), most of these development methodologies have common attributes, example, 'planning, analysis, design, implementation, deployment and security and support' (Mnkandla, 2009). These common attributes are helpful in this study to design culture-oriented e-Learning system that will address lack learners' culture in the development e-Learning system. However, the available literatures among these development methodologies shows the absence of cultural conciseness in the development process and for this purpose, this study establishes culture as the heart of the process. The section begins with the waterfall model. There are a number of methodologies that can be used in system development. But for the purpose of this chapter and study, the following methodologies in this section were discussed because of their quality characteristics in the development of an e-Learning system.

2.2.1.1. Waterfall model

The Waterfall model (WM) is a development principle based on step-by-step processes (Fitzgerald, Russo & Stolterman, 2011). As a principle, it is categorised as structured analysis which is a traditional methodology or heavy-weight method with a top-to-down development process. According to Schinckus et al. (2009), the process is linear, with a series of phases.

In 1970, Walter Royce published the first waterfall model for Information System Development (ISD). The model is limited in coping with and adapting to changes and testing is usually done later in the development cycle. In spite of the challenges, it is commonly used in the development arena and many developers still believe it will continue to dominate in the near future (Petersen, Wohlin & Baca, 2009; Munassar & Govardhan, 2010). The process involves Systems Planning, Analysis, Design, Implementation, Integration, Deployment, Maintenance and Support phases (Feitelson, 2011; Fitzgerald et al., 2011; Valacich et al., 2006; Petersen et al., 2009; Mizell & Malone, 2009). Each phase in the process is seen as a generic engineering process (Moniruzzaman & Hossain, 2013). Through the planning phase, detailed understanding of what is to be done in the design is ascertained. For the purposes of this study,

the waterfall model is discussed and used as a mechanism to assist development of a desirable e-Learning platform because of its linear sequence. But the process has failed to recognise learners culture. For it to be used, developers must understand the system and students' (users') expectations from the system planning before other phases could commence, as explained in the conceptual matrix (see Section 2.4).

Waterfall approach 'is a linear sequence software development process' (McCormick, 2012; Feitelson, 2011). Example, just as water gradually flows from top-to-down, so, the development cycle moves in a sequence from one phase to another (McCormick, 2012). As the development process progresses, the completion of one phase leads to the commencement of another, but the dilemma is lack of interaction between phases, and the end result of one phase is called deliverable (Rosenblatt, 2014). The absence of cognition and interaction among the phases signifies that one phase must be completed before another phase can start; the process cycle is called top-down approach.

In-spite of its dominance, waterfall is criticised by researchers for "marginalization of the role of iteration" in the development process (Osterweil, 2011). Also, Feitelson (2011) believed that the individual sequence process is "unrealistic" and an effective model demands iteration between the phases and the process "life cycle-objectives", and rigour. According to Munassar and Govardhan (2010), all the phases lack cognition and collaboration against each other. Nonetheless, the waterfall model can be marked for lack of proper maintenance and inability to be completed (Mizell & Malone, 2009). Again, in accordance with Schinckus et al. (2009), the model is inefficient in managing errors and flaws and recovering is costly in the development process. In summary, the waterfall model in this study can be defined as up-down development process that includes different phases. However, this study understood the disunited among the development components and cultural-inadequacy, and this show a lack on waterfall process. For e-LSDF, the root of culture-oriented e-Learning system can be executed in the phases.

The diagram below shows the interactive nature of the waterfall model in phases. The development process begins with planning through to maintenance and security; it indicates all the sequences that must be followed when working with the waterfall model.

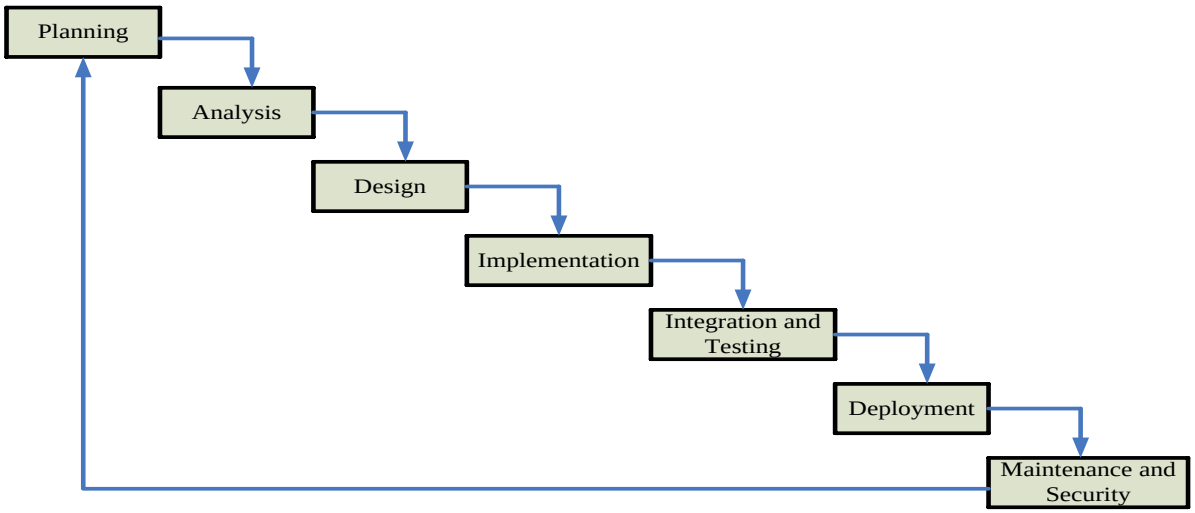


Figure 2.2: Waterfall method ***(adapted from Rosenblatt, 2014 and McCormick, 2012)***

Planning: As the first phase, the system, end-user requirements, needs and expectations are identified and the requirements are reviewed to form input in the design and implementation level (Petersen et al., 2009). The requirements are then verified to ensure that all stakeholders' expectations are noted. The phase also establishes the overview mandate of the intended system, and the risks analysis and feasibility evaluations are carried out to determine system goals. However, through this study, any developer using this methodology will determine and consider capturing of e-LSDF at this phase. The capturing demands understanding of different factors of learner's cultures and values. The second phase commences immediately. **Analysis:** The phase analysis determines suitable hardware and software and also the kind of programming language to be used and database (McCormick, 2012). The phase leads to the design phase. Importantly, any developer using this methodology will also represent and capture e-LSDF at this level.

Design: The architectural model is framed on how the system will be executed (Munassar & Govardhan, 2010). The phase involves the identification of software code, algorithm and flowchart and other design tools (McCormick, 2012). Through flowchart and diagram, the presence of culture-oriented is established in the design to allow designers to structure how the post e-Learning development will look and in support of effective learning. According to Petersen et al. (2009), this phase also decides on the needed architecture and documentation, and then the main design starts. Also at this level, any new requirements can be allowed in and the analysis phase is reshaped and design phase continues. Furthermore, the design phase also ensures that the proposed system is modelled in diagram, business processes, business rules, and entity-relationship and data dictionary in detail in the system.

Implementation: This phase starts after the design is completed. The output from the design phase is framed into small units which are incorporated in the next phase and called integration and testing. This phase ensures for coupling and cohesion among all the components of the system full functionality at large. **Integration and Testing:** The phase deals with the incorporation of all the units from implementation phase into a full system after testing is carried out. The testing is done for errors and fault identification and patching (Munassar & Govardhan, 2010). The components of e-LSDF are verified at this phase to check if the framework is well represented and reflecting on students' cultural expectations. Again, the phase's discussions continue.

Deployment: After integration and testing, deployment kicks-off in the customers' context or release in the market. Problems and errors can surface after deployment, after which modification is done, the next phase is maintenance followed by security to prevent unwanted user access to the system. This development moves over to the next are final phase but not the least. **Maintenance and security:** Errors and faults are possible after deployment during operation. Patches version can be released, then maintenance is carried out to fix the problem and changes are carried out on the post-delivery (Munassar & Govardhan, 2010). The security aspect of the system ensures that any violation and risk are prevented, controlled and corrected. For the advantages and disadvantages of the waterfall model (see ANNEXURE O).

This study summarises the definitions above. Waterfall is a systematic development method which is sequential in process into phases, development begins with elicitation of requirements from stakeholders, and the completion of the phase leads to the continuation of another. Meanwhile, the requirement is always well understood before development commences. This study adopts this definition because it understands and integrates systematic development into the framework and realising the absence of learner's culture.

2.2.1.2. Extreme programming (XP)

Extreme Programming (XP) is a business focus development process that leads to quality project development and enhancement of productivity. According to Mnkandla (2009), XP can be viewed partially as a development methodology and can also be discussed as an approach. Reason been that Williams (2007); Flora and Chande (2014) regard it supporting Agile Alliance. The development involves stakeholders and can be regarded as the first agile approach (Kaushal & Anju, 2013). It's continue as improvement-oriented in functionality, user expectation and paired programming (Munassar & Govardhan, 2010). It is also known as light-

weight software development based on engineering exercise (Flora & Chande, 2014). Although the inventor of XP intended to develop a methodology appropriate for "object-oriented projects using teams of a dozen or fewer programmers in one location" (Williams, 2007: 213), the process is goal-oriented in meeting and advancing software standard and quickly responding to changes as they occur (Kumar & Bhatia, 2012). It is also a light-weight methodology focusing on small and medium sized development teams and meeting changing in technology and customer satisfaction (Fitzgerald et al., 2011; Khramtchenko, 2004). Extreme Programming (XP), this is a light-weight development methodology (Moniruzzaman & Hossain, 2013).

As a mark of criticism from some researchers, the togetherness between clients in the development remains difficult and priority is also challenging as well and experienced skills are needed (Munassar & Govardhan, 2010). In fact, the involvement of stakeholders can also create division which can lead to delay in the process. The methodology also lack the involvement of learners culture or the integration in the development of e-Learning system. The methodology starts with the gathering of customers report (Khramtchenko, 2004). It has parallel programming which shows that two programmers can engage on the same project using one computer, one programme (drives) while other members watch (navigate) (Rosenblatt, 2014). This parallel programming can be known as pair-programming (Fitzgerald et al., 2011). According to Geambaşu et al. (2011), XP can be defined as agile development methodology that engages with customers (stakeholder) in an effort to develop standard software in meeting productivity. The methodology is regarded as an agile because it involves smaller "development cycle" aiming to minimum cost and change adaption in the development life-cycle. However, it is mainly used in frequent changing environment, and close engagement with customers is widely encouraged.

In this study, XP was chosen and discussed against other models because of its characteristics and ability to engineer collaboration between developers, clients and users in the execution of e-Learning systems. Fitzgerald et al. (2011) state that XP approach has a lot of resemblances with RAD as discussed in the Appendix. The major similarity among then is active participation and adaptive tendencies to change in the development cycle. Again, XP has a concept of testing each unit before coding is written, the concept is focus on "test-driven-design" ensuring that system goals are determined before coding begins and this guides the programmer to stay tuned with the goal at heart (Rosenblatt, 2014). The methodology has five

main principles: communication, simplicity, feedback, courage, and respect. These principles are discussed below for the purpose of delivering innovation and improved system at all time.

Communication: XP has a philosophy of oral communication and its operations aim to hearten interaction which is a key point in the development. The communication philosophy stresses that most development difficulties happen because someone refused to speak, ask question and engage with each other. Based on this, "problems with projects can invariably be traced back to somebody not talking" (Williams, 2007: 213). Every team member is encouraged through face-to-face communication (Rosenblatt, 2014), and the communication should exist between customers, developers and others stakeholders (Khramtchenko, 2004). On e-Learning design, through good communication, learners' cultural opinion and views are well gathered and understood.

Simplicity: XP focuses on a simple product design that meets customer expectations and needs (Munassar & Govardhan, 2010). The important aspect of the philosophy is to design more system focused customer requirements (Khramtchenko, 2004), than to focus on unspecified requirements (Williams, 2007). In XP, design should be simple and not simpler, aiming at current issues at hand (Fitzgerald et al., 2011). The simple design can be boosted through the inclusion of e-LSDF in the design process. **Feedback:** It is a principle that is drawn from customers' views at the end of every iteration after release. This iteration defines the next iteration report (Williams, 2007). The feedback is executed well when learners are able to understand learning content in their own way (culture). **Courage:** The above three philosophies ensure that team members are encouraged in the process. They are encouraged not to make unrealistic decisions (Williams, 2007). **Respect:** Team developers should care for each other in the project (Williams, 2007).

In summation, XP depends on "documentation via oral communication", although, oral communication can be suitable for small projects, and not suitable for large projects, "high-risk systems" (Williams, 2007). To this study, XP can be suitable even for small projects because of open communication and engagement with other stakeholders with the same principle can be adapted to the development of culture-minded e-Learning. But the facts remain that this methodology is not learners culture-oriented from inception.

2.2.1.3. Scrum

Scrum is lightweight and commonly used in development methodologies that focus on addressing complex problems and challenges in order to produce good quality software within

competitive time (Schwaber & Sutherland, 2011; Moniruzzaman & Hossain, 2013). But had failed to manage culture-oriented e-Learning system. Mnkandla (2009) regards scrum as a full system development methodology. The methodology depends on smaller teams of developers in the delivery of quality product. It is more on quality and revenue generation, it is adaptive to requirement changes and gradual software release called sprints (Kaushal & Anju, 2013). However, the sprints duration is 30 days in length (James, 2010). To Schwaber and Sutherland (2011), sprint is the centre-point of scrum with a "time-box" incremental development of two to one month process but during the development time, daily meetings are held for reviews and feedbacks. This methodology is used in this study for its ability to design and implement a system within competitive environment and short period of time incrementally allowing input continually and more discussion on the methodology in regard to this study can be found in the conceptual matrix and brief conclusion (see Section 2.4).

According to Rosenblatt (2014), Scrum is a form of agile method because of it quick in development; the name was coined from rugby word where team players hurl each other to achieve objectives. This philosophical methodology, in accordance with this study can be suitable for small projects and team members located together with one spirit, cultural concern and aiming for success. Though, some team members can be separated geographically from each other, each member can contribute daily to a meeting through telephone-speaker, teleconferencing and others (Williams, 2007). The methodology involves more mental capacity than physical interaction (Rosenblatt, 2014). The team members are self-determined, self-organised and self-directed, and focusing on defining and achieving project goal iteration and they have "authority, autonomy and responsibility" to determine how to meet the goal. Through the team spirit and effort, this research adapts the strength of the methodology to bring together all the stakeholders on e-Learning to impact upon a culture-minded design in solving complexity problems confronting e-Learning in the learning systems.

Other researchers sees the methodology as a development framework. As James (2010) added, Scrum is a development framework for incremental management of system product among few developers with cross-functional tasks. The framework allows for structured roles, collaboration, group discussion, standard, rules and information. The process also involves members who are in charge of change adaption and knowledge creating in the development cycle (James, 2010). Again, it can be seen as a general-function in dealing with complex deadline and requirement to advance standard (Kumar & Bhatia, 2012). Through this

explanation, the approach can handle cultural variables among students using e-LSDF philosophy because of its generality in function and application.

Furthermore, it is a loose system development procedure that combines known activities, "workable tools and techniques" that developers can use to assemble a system, but the loose attribute of the activities endanger the control and risk aspect of the development (Schwaber, 1987). As iterative and incremental object-oriented system development process with benefits attached, the approach improves system flexibility in meeting current and future requirement in the development cycle and is able to deliver needed systems (Schwaber, 1987). In accordance with Schwaber and Sutherland (2011), in 1990s, the framework aimed to handle complex system development process, it is not just a process or technique for system development only, but a framework that contains different "processes and techniques". This bracket of framework can add e-LSDF when developing e-Learning platform.

For this study, the methodology can also be used as 'management, improvement and maintenance' for current system and the delivering of prototype. Now, through this study, e-Learning needs a methodology to reflect on current expectations before the final version is leased and having complexity addressed within a short period of time in order to accommodate social changes. Again, the methodology is planned around 'customer's requirement' (Schwaber, 1987). All these characters and feature make Scrum worth usable in the culture-minded e-Learning in this study. Nonetheless, this methodology couldn't mention or recognise learners' culture in its processes.

2.2.1.4. Spiral-Education (Spiral-ED)

This section deals with how the Spiral method is used in system development and its role in this study at large; however, a summary of the method is seen with the conceptual matrix and brief conclusion (Section 2.3) below. To make the iteration process clear in software development, Barry Boehm (1988) proposed spiral model as alternative method based on "risk-driven" development process (Schinckus et al., 2009). Boehm identified risk analysis at each level of iteration in the development as the aim (Osterweil, 2011), but, due to uncertainty, risk reduction is vital (Feitelson, 2011). According to Munassar and Govardhan (2010), Mizell and Malone (2009) and Boehm (2000), the spiral model is an incremental development process which focuses on risk exploration and solutions identification. To mitigate risk, planning is done and prototype is developed to showcase the overview of the software under development, after which other development phases follow like design, implementation, coding, testing and

maintenance. From the cycle process, e-LSDF is analysed at the planning phase so in order to strengthen the system requirement and user satisfaction, although cultural consideration is questionable in this model. Spiral is among many methodologies used in SE principles in the past decades. However, spiral has two types, the first cyclic approach deals with incremental development process of analysis and implementation and risk reduction while the second one is on "anchor point" that ensures commitment among stakeholders and system satisfactorily (Schinckus et al., 2009). To better execute the Spiral approach in e-Learning, Spiral-Ed was initiated. Spiral-Ed can be seen as education version of spiral; it is a methodology designed to let systematic attachment of student learning setting and experience into the development process (Calvo et al., 2007). For the purpose of this study, the later part of the section of the approach is a vital feature which will assist in the execution of e-Learning system that can affect the learning process positively through e-LSDF execution.

The process is iterative in nature, users feedback is collected throughout development till the final product is delivered (Shelly & Rosenblatt, 2012). However, software engineers analyse the system requirements, comprehending end-user needs, expectations and wants, conduct system feasibility study, defining the solution and updating the requirements into product operational mode (Calvo et al., 2007). But this analysis can be challenging both in business, industrial, management and educational system arena. The model is advantageous due to the fact that risks are realisable early and it delivers quality software earlier (Munassar & Govardhan, 2010). While drawbacks are associated with the model on the account, it can be costly to use, technical expertise is needed through unsuitable for small projects (Munassar & Govardhan, 2010; Mizell and Malone, 2009). The position of culture and its representation is not clearly noted in this methodology, and this can be seen as a challenge and drawback to it. The inclusion of the study framework on Spiral methodology during design may be taken as an ideal solution in overcoming recognised drawbacks and the ability to understand potential risk on time.

The discussion continues to show that the Spiral-Ed methodology enables developers (teachers, software engineers, interface designers and instructional designers) to discover the needs and expectations of users (students) in the learning environment and the mandate of technology in learning. The methodology also ensures the incorporation of educational mandate into technology. This study adopts spiral-Ed as used methodology because of its obligation in education. Although the model is organised in layers, the first level or layer as seen below focuses generally on normal software development, while the second layer is more on

educational software development (Calvo et al., 2007). Overall, the diagram shows spiral-Ed and its cycle features, but the missing link between this and Boehm88 published spiral model is on nonexistence and how e-learner's culture will be captured.

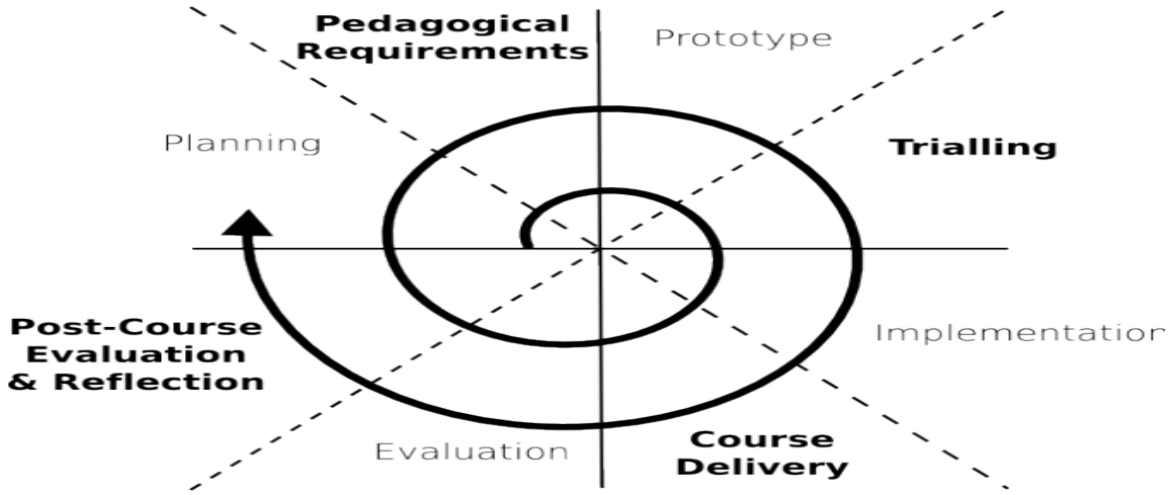


Figure 2.3: The structure of Spiral-Ed methodology (*adapted from Calvo et al., 2007*)

The diagram exploits spiral-Ed methodology as noted. It has four steps which are divided into two parts; generally, each of the iteration may be completed in a year or more within a cycle of milestone. In education, one cycle is completed in a year; however, the model provides a road-map throughout e-Learning system development life cycle and the iteration cycle can be applied in both small and large projects (Calvo et al., 2007). Presently, technology and its features are ever changing and a quicker or fast methodology is needed, meaning, slow development is not expected in e-Learning development process in order to accommodate innovation. This methodology can easily be implemented into development step-up and the stages are educational and engineering goaded (Calvo et al., 2007). According to Calvo et al. (2007: 5), the engineering processes have the following stages, "planning, developing a prototype, implementation and evaluation" and educational stages are "assessing the pedagogical requirements, trialling, course delivery and post-course evaluation and reflection".

To this study, spiral methodology is a two layer model used for problem identification, risk and system development analysis. The commitment and engagement among stakeholders is usually core in the process, however, it ensures that e-Learning objectives are attained, though the duration to complete the process which is an issue even to this study. The first two layers of the spiral-ED model stand for standardised traditional spiral as seen in these (Boehm, 2000; Munassar & Govardhan, 2010; Feitelson, 2011; Osterweil, 2011) and the other two parts reflect

spiral-Ed methodology as stated earlier (Calvo et al., 2007). The phases also begin with planning:

- ✓ **Planning:** This phase deals with the planning of the project commencement, gathering of project or software, user requirements and system design. The information gathering process can be internal or external. As any other methodologies, the phase seeks in-depth understanding of the system requirement and what the need-users expect. Then, the development of e-Learning system demands the consideration of learner's culture at the planning phase of this method. The phase also involves pedagogy evaluation. The educational aspect of the diagram is **Pedagogical requirements:** It involves gathering of pedagogical requirements (Greaney & Ellis, 2005). The information is gathered from teachers in regard to teaching and learning activities, the fundamental pedagogy, the accessibility of the activity and formal feedback from learners on learning activity that help system developers. The system should elucidate the task of teachers and the things learners should learn, and how it should be learned. (See section A of the chapter for more explanation on pedagogy).
- ✓ **Prototype:** This is a compulsory phase in any engineering development. It is usually built for testing purpose in a project and also evaluating risk analysis against project outcomes. The objective of prototype as used in e-Learning is to evaluate if the expectations are met. **Trialling:** This is the educational version of the model. The focus point of this stage is to test the prototype against learner expectations and flexibility in education. Trialling may comprise both teachers and students expectations in combination of student's insights of the software and their styles can be evaluated on the learning activity. However, the prototype should include the software main functionality to deliver effective learning activity. System functionality is judged on its ability to address user needs and addressing these needs a framework to accommodate the fundamental context of learners. The challenges call for a culture-oriented framework as the answer, meaning that users will be able to use the system in their own cultural settings.

The second part of the model begins with spiral-Ed and standardised software methodology (Calvo et al., 2007; Boehm, 2000; Munassar & Govardhan, 2010; Feitelson, 2011; Osterweil, 2011):

- ✓ **Implementation:** The functional design is executed to use and also test for quality assurance in any system and also in e-Learning system. **Course Delivery:** After the

execution and testing phase, the software is delivered to users and quality assurance assessment is done later, this development aspect has proven to be important in the development process.

- ✓ Evaluation: The outcomes of the software product are evaluated in this phase before other iteration phases can continue (Calvo et al. 2007). The evaluation takes into account other phases. **Post-course evaluation and reflection:** According to Calvo et al. (2007: 6), "Our methodology requires a post-cycle evaluation and reflection to be included". At this point, the learners' knowledge is collected and analysed, and recommendations are made based on the report.

According to Calvo et al. (2007), some educational software applications, like Beehive, DotFolio and others use these pedagogical phase requirements, trialling, course delivery, and post-course evaluation and reflection in delivering learning software. However, notwithstanding the acknowledgement of pedagogy on spiral, the capturing of learners culture was not discussed in the design of an e-Learning system development. Based on the multiple views of the spiral methodology, the methodology can address the lack of learners culture absence because the methodology is eager in designing a system for learners to engage in an effective learning process.

Nonetheless, to some researchers, development methodologies is seen as price rules that aim to identify system feasibility to solution in a unique development context and the process includes analysis, design, implementation, deployment, testing, and maintenance plans, which the process begins with problem statement and ends with desired result presented to users for testing (Burback, 1999). Then, this process is determined by lay standards, approaches, actions, and practices used in the development of software and similar products (Kaushal & Anju, 2013). Continually, the processes aim at determining how system development is designed, organised, implemented quickly or meeting budget and requirements in the development cycle. However, many experts believe that this process has failed. Sometimes they believe that failure can only be resolved through agile methodologies (Kaushal & Anju, 2013). The factor here is whether agile methodologies have closed the gap.

Among these few definitions, this study adopts Burback (1999) definition of SDM. E-Learning development should begin with a goal, through which analysis is done to understand what stakeholders want, and then other phases can commence. E-Learning system development will be better if the integration of e-LSDF is considered during the analysis phase and throughout

the development cycle. At this point, we can say that SDM is a detailed development guideline that provides development process. These processes can be applied to any IS (e-Learning) development from the beginning to the end.

2.2.2. System development approaches (SDA)

More often the term 'approach' is interused with framework, methodology (Mnkandla, 2009). Then, approach can be regarded as the tradition of carrying out something. It the fashion that is followed to develop any software systems (Mnkandla, 2009). Traditionally, a structured approaches focuses on step-by-step system development process (Valacich et al., 2006). It can also be seen as the backbone for any system or software development. Structured approach can be regarded as plan-driven. The plan-driven process starts with documentation and ingathering of complete requirement, and then the development plan can begin (Williams, 2007). However, the easy the requirement, the easy the plan would be. Furthermore, plan-driven method has been a traditional approach for software development process (Williams, 2007), the process also involve e-Learning system.

Although it can be said that plan-driven approach is static in nature, progressively, in the mid-1990's, practitioners began to feel and realise the impact upon change in software requirement and development and these changes called for radical approach (Williams, 2007). The changes affect the software industry, the technology, customers' expectations and managing customers' inability to state in advance their requirements. Based on this, agile and other iterative methods emerged to consolidate this gap.

This section cannot be complete without showing the different approaches that make-up development approach in this study. The approaches are: Agile, and Joint Application Development (JAD). But, according to Singh and Kotzé (2003), most of these development approaches have things in common, example, 'planning, analysis, design, implementation, deployment and security and support'. These common characteristics are helpful in this study to design culture-oriented e-Learning system that will address learners cultural exclusion. Good learning approach depends on how cultural factors influence the development framework in relation to what learners see, feel and understand using symbols and others. But these approaches had failed to deliver on culture-oriented e-Learning system.

2.2.2.1. Agile approach (AP)

In this study, agile should move e-Learning system design from heavy to light-weight. Agile can be difficult to define, but it's a unified standard for "well-defined methods", Alistair

Cockburn is among proponents of agile movement and he describes agile as effective and manoeuvrable process, both light and sufficient (Kaushal & Anju, 2013). The lightness indicates being manoeuvrable, while sufficiency means remaining in the game (Kaushal & Anju, 2013). Other experts like Barry Boehm (1988) define agile as a quick prototyping and development process. Software, businesses and e-Learning environment is dynamic, the failure of traditional or heavy-weight development in meeting system and clients' requirement calls for a fast delivery approach that can accept changing requirements and environment (Moniruzzaman & Hossain, 2013).

Agile approach is promising model towards software development that runs smoothly without overrun budget and time (Firdaus, Ghani & Yasin, 2013). It is also aimed to develop good software on time, having unified team members, full engagement and involvement of customers throughout the development cycle. The development time to market is also reduced and the technique has quicker response to changes in the cycle (Kumar & Bhatia 2012). Again, agile methods are aimed at developing the system incrementally which is called Agility. Agility is the processing of software to select and adapt to changes in the development cycle more quickly and effectively (Kaushal & Anju, 2013; Moniruzzaman & Hossain, 2013). So far, there was no mention on culture, e-Learning or learners culture in the definitions.

The innovative nature of technology and also learning media, and changes in system and user requirements demand a kind of methodology that assists the e-Learning development process, while agile methodology has the potential of achieving this in the development. The use of the model in this study is based on its characters and ability to power up implementation in e-Learning design, helping the integration of e-LSDF to be evaluated quickly in meeting learning needs and expectations.

The process also involves feedback review, extension and on-going incremental and integration of previous version with newer versions also known as light-weight methodology (Kaushal & Anju, 2013). The method ensures that the development is completed on time without exceeding its budget time (Firdaus et al., 2013). An e-Learning process is ever changing and there is no need for delay. The innovation attached to e-LSDF should be incorporated in the development process, but the approach neither to acknowledge culture or learners culture.

Furthermore, the method was established on principles and a manifesto. The manifesto defines system development process in agile (Kumar & Bhatia, 2012; Flora & Chande, 2014). The method began in February 2001 when a number of engineering consultant met to classify

comparable change-mind methodologies, and to react to changes in methodologies. Agile Alliance was formed by the consultants with a set of Principles in support of the Agile Manifesto. The methodologies supporting Agile Alliance (AA) are Crystal, Adaptive Software Development (ASD), Extreme Programming (XP), Agile Modelling (AM), Feature Driven Development (FDD), Dynamic Systems Development Method (DSDM), Agile Unified Process (AUP), Lean Software Development (LSD) and Scrum (Williams, 2007; Flora & Chande, 2014). These methods are more principle-based than rule-based, meaning, having pre-defined rules or plans concerning function, customer, relationship, activities, and developers. The developers and managers are led by these principles to meet customer expectations early and continually, welcoming changes at any stage with delivery of working system within weeks to months, customers (business) and developers working together throughout the project, while motivated individuals with support are deployed. To Kaushal and Anju (2013), agile methodologies show faster ways in software development 'by doing it and assisting others do it'. The agile principles and manifesto are well articulated and defined but failed to direct them towards building culture-oriented e-Learning system.

For the benefit of this study, the advantage of the agile approach is well suitable in the development of e-Learning much more when integrated with e-LSDF. The approach is a better way to gather information and face-to-face discussions with the working system as the primary goal. The primary aspect is suitable when learners' cultural-factors are gathered. Again, all agile procedures support sustainable improvement, continual engagement among stakeholders, continual focus on technical and quality design promoting agility, simplicity and effectiveness (Williams, 2007). Furthermore, according to Bajnaid, Benlamri and Cogan (2012), the agile approaches are software development methods within new paradigms. It is based on team-work, development is broken in phases or iteration for an easy functionality, all design is built and tested continually (Shelly & Rosenblatt, 2012), and increment is affected by previous accumulated ideas (Rosenblatt, 2014). On like structural model that deals with testing at the end of coding, agile involves testing throughout the development process. Its ability to test continually assists all stakeholders to evaluate if their ideas and expectations are met.

This means that agile is yet to achieve its mandate and manifestos. After an extensive study of Agile approach, the study discovered that Agile mandate and manifestos met well for the development of quality of information systems timely. But this approach has failed to recognise learner's culture or how their culture can be represented or capture in IS. For more this failure,

check out conceptual matrix and brief conclusion (Section 2.4). For more discussion on agile approach disadvantages, see ANNEXURE R.

2.2.2.2. Joint application development (JAD)

As a development process, JAD involves managers, users and developers, while one of the phases is dedicated to fact-finding. It can be said that JAD approach is based on user-oriented eliciting system requirements modelling from users through fact-finding methods and allowing active participation of users (Rosenblatt, 2014). The point to consider will be to determine whether learner's cultural expectations are among the focus on "user-oriented" mechanism.

Users are actively involved in the development process, because they are regarded as integral part of the information system development life-cycle. In the past, developers were fully responsible for the development process and users were passively involved, but presently, users are fully involved, because developers have recognised that development should be user-oriented (Rosenblatt, 2014). However, each stakeholder in the development life-cycle is allocated independent roles to play, while users, developers and managers are engaged into frequency meeting headed by JAD team leader (Valacich et al., 2006).

Importantly, the user's active participation is advantageous in JAD. Stakeholders have the sense of ownership in the development and are able to support the new process and the active engagement between developers and users promotes and delivers a high quality system. It can be costly and difficult to handle large groups in the development cycle and this is a disadvantage. Through the advantages, e-LSDF is well suitable in JAD because of the full involvement of stakeholders in the development process. However, according to studies available, the place of a learner's culture is missing from JAD. This study will purposively integrate e-LSDF in the process. More analysis in JAD and its purpose in this study are discussed in the conceptual matrix and brief conclusion (Section 2.4).

To this study, JAD is an end user-focus development approach that is aimed to amend development errors of the past that exclude users in development through traditional methodology (waterfall); information is gathered from users and other stakeholders in order to deliver a system that fits into the expectations of the users.

2.2.3. Systems development models (SDML)

Development model facilitates system projected solution (framework) to action. A model can be seen as a process to transform suggested solution to desired output (Mnkandla, 2009). Then development can be used in this study to transform the proposed "Seven cycle culture-oriented

e-Learning system framework" (SCCOe-LSF) to produce desirable culture-oriented e-Learning system. Through the output, the explored problem in this study can be addressed. However, this section will establish whether culture was mentioned on the discussed model. In this study, this can be classified as a model:

2.2.3.1. Analysis, Design, Development, Implementation, and Evaluation (ADDIE) Model

ADDIE model is an iterative education design methodology. Informally, ADDIE was developed from the Information Systems Development (ISD) models (Justice, 2011). ISD is widely used on Instructional Design (ID) model (Wang, Brown & Ng, 2012). As a sectional development process model, each part is compared with one another iteration. The model consists of five phases starting with Analysis to Design, Develop/Decision, Implement and Evaluate (Wang et al., 2012). In the Analysis, the developer(s) clearly comprehend the "differences" among expected results and the existing skills and knowledge in a learning environment (Fardoun & Alghazzawi, 2012). According to Sheypak et al. (2007), leaders in "MATI" Russian State Technological University, gathered in 2005 to seek better ways in dealing with the challenges confronting the implementation of e-Learning in the higher education institutions. In the effort, ADDIE development model was initiated. The model is seen as a designed instructional model for different educational content development; the acronym is noted with capital letters (Arkün & Akkoyunlu, 2008). Also, according to McGriff (2000), it's a systematic approach with the purpose of making learning learner-oriented rather than a typical teacher-centred approach. It can be said that ADDIE is a learning framework that focuses on efforts to bring learning materials closer to the users. As a learner-oriented model, the discussion will tell whether it have managed to bring learners culture in the development process. It is widely used in ID, and for this reason in the study, the model was discussed as a suitable model for the execution of e-LSDF, though, readers should look-out for more analysis on the conceptual matrix and brief conclusion (2.4) section below.

ADDIE model is used in developing a structured and balanced e-Learning system that meets teaching and learning objectives. This model shows how e-Learning system development process and issues deal with every stage; it can also be regarded as development methodology. In contrast, the model is criticised for being very systematic, linear, constraining, unbending and time-consuming to design (Fardoun & Alghazzawi, 2012). It is also seen as e-Learning development process for its willingness to gather learners' needs. Figure 2.4 illustrates the sequential process of ADDIE and how phases are arranged in the development. The completion of one phase allows another phase to start.

However, ADDIE model can be seen as a "waterfall" process because of its development procedure. According to this study, ADDIE is an objectivity teaching and learning structure focused on delivering comprehensive e-Learning that improves the interaction between teacher and learner and meeting educational goals through iterative phases.

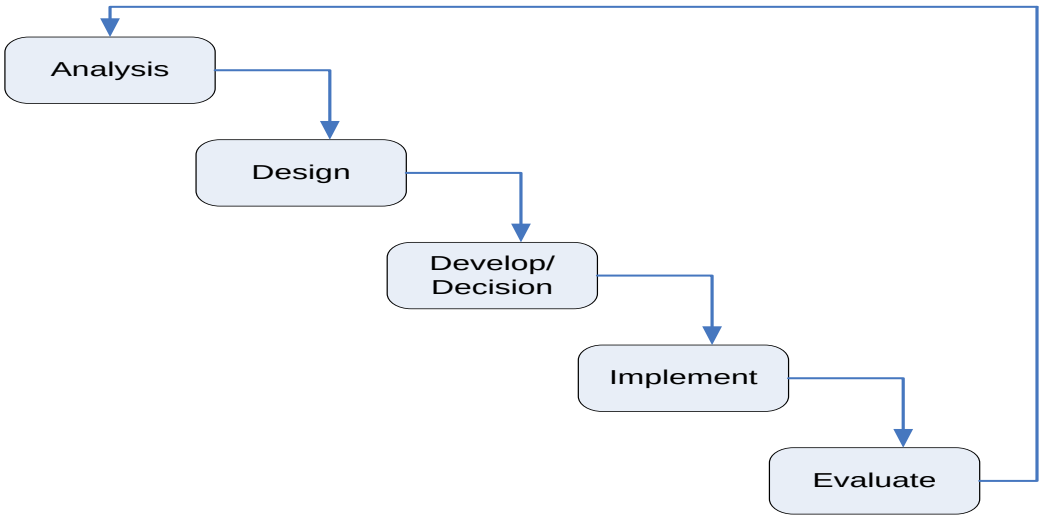


Figure 2.4: ADDIE Model structure (*adapted from Perfect Performance Training (PPT) (2009) and Arkün and Akkoyunlu (2008)*).

The ADDIE model explained:

Analysis: The model begins with a description of what is to be taught, which determines the needed skills, existing skills and knowledge level and differences between them. However, the system and customer needs are determined, problems are identified with their root cause and analysis and solutions formulated (Arkün & Akkoyunlu, 2008; FAO, 2011; McGriff, 2000). It also deals with the determination of actual audience, system expectations, development time frame, budget, language, influencing factors and other resources available for the execution of the programme (PPT, 2009). Most importantly at this point, the e-LSDF framework is captured and carried on to other phases. Although it can be argued that ADDIE is static in nature, however, capturing e-LSDF at this stage gives understanding of which components and features to include in an e-Learning system during development.

Design/Decision: After the analysis phase, the module, duration, graphics type, video and audio clips, interface and content consideration, attractiveness to end-user are designed. The design and formulation of objectives, learning and delivery strategies, contents design and exercise are stated (FAO, 2011; Fardoun & Alghazzawi, 2012). It is also in this phase that other leaning channel like 'instruction method, learning activities and evaluation process' are

determined with supporting documentations (Arkün & Akkoyunlu, 2008; McGriff, 2000). ADDIE is seen as the centre point of structure in e-Learning tools, because the system must be able to understand the module(s) and users' expectations (PPT, 2009). Again, learning materials like PowerPoint slides, Microsoft word document (Ms-word), spread-sheet and other files are designed, originally and these files may not display e-Learning as it is, rather it will be reconverted and re-built automatically (PPT, 2009). However, e-Learning is modelled using diagram and dataflow symbols to showcase how components and features in the system are represented.

Develop: This stage deals with module building and construction with appropriate development tool(s) (PPT, 2009). All the modules of multimedia presentation are prepared here. It is a step toward the development of instructional contents, and products are created and evaluated for correction and modification if necessary. All the analysed information plans are executed and tested (Arkün & Akkoyunlu, 2008). However, the analysis of the component of e-LSDF is done for the proper execution of e-Learning system that is culture-oriented.

Implement: The phase deals with the testing in order to discover flaws and errors in the system. The developed system is tested in real-life practice with a full support for students' activities in order to understand the content objectives without missing words (Arkün & Akkoyunlu, 2008). Also, in this phase, the system is delivered to users for efficiency testing and material evaluation (Fardoun & Alghazzawi, 2012; McGriff, 2000). The implementation involves the verification of all components.

Evaluate: This phase checks on previous stages to determine whether the implementation stage is correctly done throughout the design process (PPT, 2009; Arkün & Akkoyunlu, 2008). According to PPT (2009), evaluation takes two things into account (1) Is the system's specification met? and (2) Are the end-users needs and expectations met? The two evaluations are done to determine whether the system meets learners' needs and objectives. At any time, any phase can be revisited, modified and corrected as reflection on the system requirement (Arkün & Akkoyunlu, 2008). Moreover, the answer to both questions should show that the system is well executed, if not, then verification is done to ascertain the missing components in the implementation. To this point, the above diagram has shown iteration nature of evaluation in system development; however, evaluation is vital in all process at large. For effective execution of e-Learning system using the ADDIE model, this study must follow the five phases in the development process. In reflective on the ideas behind this model and in line

with the problem under exploration, it was realised that ADDIE model have no place accommodating or capturing learners capture in its overall execution. This realisation was based on the discussion and it indicates that ADDIE had failed to address existing software crisis. To further showcase the exclusion of learners culture on this model and other methodologies and frameworks were summarised in Section 2.4 below.

2.2.4. The overview of the methodologies, approaches and model in relation to the problem statement.

Since SDM, SDA and SDML is not culture-minded, this section of the study deals with brief reflection and summary on these development methodologies, approaches and model in line with this study problem statement. The reflection is also on e-Learning development, and draws inference from the problem statement in chapter one and their failure to shed a light in addressing the problems identified. After many years, the software crisis is still an issue of concern to manage by software engineers and Software Engineering (SE) has strived so much to remedy the situation. SE is seen as the entire methodological procedure used to implement software's of all scales (Boehm, 2000; Mnkandla, 2009). Methodology can then be defined as structure rules, processes, techniques, philosophies, tools, phases, documentation and others for IS development (Papatsoutsos, 2005). While approach deals with fashion things are done and model shows how process are carried out to produce results. Nonetheless, there is no single explanation in this regard; rather most definitions are based on structured procedure while others are less, but most of the definitions are against each other but the characteristics remain the same. While a method is a systematic way a task can be accomplished. Overall, methodology is the "meta-method or method of methods" (Papatsoutsos, 2005).

As a methodological process, SE aims to formulate guides in strengthening and providing solutions to the existing software crisis. But the process remains challenging and the solution to its remains mountainous to developers (Osterweil, 2011). Though in the field of learning, capturing students learning experience and ideas is always complex as a result of increasing changes (Calvo et al., 2007). Education institutions and other organisations are seriously investing heavily in e-Learning because of opportunities attached to it and the crisis is bound around the e-Learning development process. In dealing with these challenges and other enormous tasks in e-Learning technologies, e-LSDF aims to bring fresh air into the field of software development in overcoming the existing challenges on capturing culture in e-Learning system.

However, e-Learning systems and technologies are developed using the same methodologies, approaches and models for non-educational systems to impact upon learning, but the improper use of them all can hinder the mandate of learning technologies in empowering effective teaching and learning (Calvo et al., 2007). Furthermore, the present tools for e-Learning development can be luxurious, rarefied and prolonged but the final product is often low in standard and difficult to implement and maintain (Arman, 2010). To a greater extent, the implementation of appropriate e-Learning system with the right methodology, approach and model remains challenging and complex. To tackle this challenge, current methodologies, approaches and model tried to break the development process into parts but these parts do not form a whole system at the end of development (Calvo et al., 2007). The inputs from them have strived to appeal to the development process but fall short of ideas in capturing learners' cultures, to this study; this can be attributed to the current development complexity and software crisis.

2.3. SECTION B: e-LEARNING SYSTEMS

This section of the chapter centres on Learning Management System (LMS), e-Learning framework and theories and e-Learning. e-Learning facilitates educational learning process anytime, anyplace and anywhere; the process is continually changing education activities and landscape via the effort of ICT through the Internet. The integration of ICT into education brought about great innovation into learning methods. This innovation is accelerated through the Internet with open doors of opportunities for information accessibility and many more in the learning space (Niculescu-Aron, Asandului, Mazurencu & Mihaescu 2007). For this study, learning is a long or life-term journey. In recent times, workers are compelled to undertake "lifelong learning" in an effort to advance knowledge and skills in the work place and increase productivity (Attwell, 2007). Though e-Learning commands change in development environment and persistent learning (Epignosis, 2014), the changes are able to turnaround work-space, implement, adopt the use of e-Learning systems. And indications shows that the current e-Learning system development lacks culture-oriented mechanisms. Its offers learners self-destined learning platforms and for this reason, a paramount step is needed to make the e-Learning process reflective of user culture and running in any platform like Personal Learning Environment (PLE) (Attwell, 2007).

PLE was introduced with the aim of achieving self-controlled learning, increase and expand learning space and provision of tools and techniques across different users (Attwell, 2007).

This platform focus on the positive aspect of e-Learning and delivering learning contents to learners and this study is not left out of this platform. This study is centred on e-LSDF, however, e-LSDF can be seen as a rapid framework to promote suitable learning style that conforms with individual learning culture formally and informally, but learners' knowledge and skills acquisition is via a different approach in a certain cultural setting. To the best of knowledge from the literature, culture-oriented system is inadequately not represented in the present pedagogic theory framework (Kolås & Staupe, 2004) as stated earlier. On a personal level, e-LSDF will bridge inexistent culture e-Learning development framework and promote effective standard methodological processes.

Based on the viewpoint of e-LSDF, this study will also project culture at the heart of e-Learning system development. This signifies that learners will be able to use e-Learning and understand any particular content in their own cultural setting. To be successful in this section of the chapter, the following headings were used: LMS, literature on e-Learning framework and theories, the link between e-Learning, online learning and distance learning/education, e-LSDF, e-Learning pedagogy and framework and conceptual matrix and chapter conclusion. Each of these titles contains vital subtitles aimed to achieve and present e-Learning and its attributes in this study.

2.3.1. Learning Management Systems (LMS)

Learning Management Systems (LMS) is an incorporated system used to support the effort of teachers and learners while using e-Learning development (Despotović-Zrakić, Marković, Bogdanović, Barać & Krčo, 2012). LMS is used by teachers to design and implement "web-based course" material, tests, quizzes, and monitoring student learning progress continually and engaging in communication with students. Students also use it for learning, engaging with each other and communication with teachers for the purpose of delivering the effective and active learning model. For this study, the section 2.3.1.1 and 2.3.1.2 discussions are categorised under the family of LMS.

2.3.1.1. Sharable Content Object Reference Model (SCORM)

The literatures have suggested many approaches for reuse in existing e-Learning development environment, such approach is SCORM as e-Learning model initiated by Advanced Distributed Learning (ADL). The model is suitable for online learning or education interoperability of learning material (Arman, 2010). The SCROM model is an e-Learning standard. The model is commonly used in Learning-Object (LO) that encourages 'reuse of educational material'

between different system formats, for example, LO repositories and learning programme (García & Esteban, 2013). However, LO is the main component for educational content reuse, it can be defined as digital and non-digital entity that ensures content reused in "technology-supported learning" (Mansouri, Mille & Hamdi-Cherif, 2014).

It also supports that the reusability of the digital format for learning content accessibility, exchangeability, lastingness and others. Also, another learning standard, Learning Object Metadata (LOM), confirms comparability learning content and the ability to facilitate the usability of learning content (Mansouri et al., 2014). Interoperability and reuse are also important aspects of LOM. LOM also helps to store information (data) on descriptions (metadata) in regard of the book with version, name, author and many others (Mansouri et al., 2014).

Nonetheless, according to Arman (2010), SCORM is executed online learning approach for digital teaching and learning known as 'Learning Object'. The LO is self-independent and can be used in numerous ways and context involving online courses, content and knowledge management systems and 'performance support systems. However, SCROM is advantageous but is expensive in small e-Learning material initiatives. As a commonly used model for LO, the purpose is to make educational contents more accessible and reusable across different platforms (García & Esteban, 2013). Though, there are benefits and challenges on e-Learning materials and approach in application of reuse materials, some of the benefits are risk reduction, improved standard, quality, productivity and many more. Some challenges are difficult in finding reusable components, expensive in maintenance cost, inadequate support tools and others (Arman, 2010; García & Esteban, 2013). According to Arman (2010), the reuse of approach takes into consideration some materials like syllabus (it forms part of "Intended Learning Outcomes (ILOs)" and course content) and contents (the content consists of modules that form a chapter). The reusable material can be constructed but at the same time be difficult, time-consuming and erring and the material should be allocated to the content and components for benefits in the approach (Arman, 2010).

Based on the mandate of this approach as an e-Learning standard, it projects the good idea that impact upon learners in the teaching-learning process. For this study, this approach will align learner culture into e-Learning platform for the same original mandate of SCROM, and, to advance this, the cultural aspect of learning should be accommodated in order to deliver much

needed and current learning content and materials using different tools and menu that is culture-oriented in nature.

Nonetheless, this study suggests SCORM as a compatible e-Learning reuse approach for the development of culture-oriented e-Learning systems and tools. The approach can be scalable, meaningful, it can be reusable against any future changes and modifications at any time. Although, there are three models of SCORM (García & Esteban, 2013), these models can work well in this study for a better execution of the e-Learning system:

- ✓ **Aggregation Model (AM):** this model shows how learning or educational materials can be parcelled in a .zip folder in the form of audio, videos, html and their source, the folder allows the materials to be sharable between different systems and also on post-reuse of contents. The materials can be culture-oriented in way that learners will be allowed to choose the culture (language) of their choice while using them.
- ✓ **Run Time Environment:** it depicts the link between e-Learning (LMS) and server where learning content is kept.
- ✓ **Sequencing and Navigation Model (SCORM-SNM):** the model contains rules on how learners can get educational knowledge. Meaning that the educational knowledge can be made available in learner's culture with attached rules on the usage.

At this point, the researcher supports the reusability of components that will allow and promote learning materials to be used over and over. Because it will boost usage confident and comfortability on the system and material. For this study, this model is used in a way that one component can serve in more than one single place on learning environment while implementing the e-Learning platform. The section continues on Modular Object-Oriented Developmental Learning Environment (MOODLE) which shows widely open-source learning systems.

2.3.1.2. Modular Object-Oriented Developmental Learning Environment (MOODLE)

In the e-Learning-learning process, MOODLE is one of the commonly used "open-source systems" approach (Despotović-Zrakić et al., 2012). According to Despotović-Zrakić et al. (2012), University of Belgrade has been using MOODLE for more than five years now to effect teaching and learning. For example, the Faculty of Organisational Science is using it for e-business on Laboratory. Every year, over 700 students in Undergraduate, Honours, Masters and PhD studies use MOODLE in different academic fields. Although, the purpose and

mandate of MOODLE remain the same in support of learning (Orosa, 2012). However, MOODLE is among e-Learning platforms (García & Esteban, 2013).

Conversely, the operation of open-source e-Learning is based on MOODLE; however, many of the higher educational institutions are involved in MOODLE (Arman, 2010). Because it is based on open-source and free-of-charge, it encourages engagement methods among users. According to FAO (2011), initially, the approach aimed for an 'education, training and development' platform to assist educators to develop learning materials that promote collaboration and engagement among stakeholders. A study shows that the approach houses over 50, 000 registered sites and one million users worldwide, and it can run on Windows, Linus, MacOS and others without modification, but the operating systems must support "PHP scripting language" and database that support SCROM and AICC principles (FAO, 2011). The extent of usage of the approach across different nations and cultures calls for a framework that recognises the differences during design and post-design and such framework is e-LSDF in order to couple different learner cultures into the e-Learning platform while using MOODLE.

Furthermore, Orosa (2012) believes that MOODLE can provide answers in the teaching-learning process. The principle of Bologna Declaration is what MOODLE method conforms to; again it is a web-application that helps the use of web and Internet to reach many students. The growth of the approach goes with challenges and problems. According to Orosa (2012), as well as by "programmers and education theorists", it also used by both teachers and learners to give meaning to online teaching. Osepashvili (2011) see the approach as important in e-Learning development and implementation because its assists in module writing, providing learners with discussion forum and others which make virtual learning easy. LMS is among other learning features with a mandate to improve the quality of learning materials and prove tools that e-Learning system can use (Aydin & Tirkes, 2010). At this point, e-LSDF can be implemented in MOODLE for closer features and components to the learners and facilitating the objectives in general.

Furthermore, this learning platform is used by many education institutions around the globe with the aim to affect positive teaching and learning. This platform does not function effectively without learner-oriented framework because the approach has failed to recognise learner culture and identity and is much more culture-oriented framework as proposed by this study. The open access of the model makes it an ideal platform for facilitating learning, because

users are allowed to use the tools in a favourable way, when culture-customisation is needed in the platform so that learners can input culture features and attributes suitable to them.

It can be concluded according to this study, that MOODLE is a self-administered open-source e-Learning system platform that aims to provide effective learning environment, communication and engagement between users and enhancing teaching and learning. The integration of this study using MOODLE platform makes e-Learning interesting, flexible, understanding, and user-friendly to what learners can see and relate to in learning.

2.3.2. Literature on e-Learning frameworks and theories

2.3.2.1. Hofstede's laid popular e-Learning framework

A framework is seen as a guiding principle in designing a model. According to Iivari (2005), a framework is used in any study. And to Mnkandla (2009), a framework is a principle that shows steps to implement a solution. The use of a framework gives an idea of how a conceptual model works after development. The implementation of an effective e-Learning system involves a process of planning (analysis, budgeting), design (system and environmental design), development (system and contents development) and management (like curriculum, evaluation, interaction and communication management), and the entire process need an integrative framework (Lee, 2013). However, many organisations depend on a framework process for e-Learning development in modelling real life problems like culture representation but some use this process differently from others. Culture involves seen and unseen events (Kummer et al., 2012). The development process considers cultures which include touchable and untouchable symbols. Achieving this needs a robust framework that values culture from the beginning of the design (Choi, Lee, Kim & Jeon, 2005). The programmes that run on computers can either be influenced by "mental programs, or software of mind", which lies on the thinking, behaviour and feeling pattern (Hofstede & Hofstede, 2005). The most popular culture framework is the one initiated by Hofstede which focuses on organisational, national and individual cultures. However, the robust framework below comprises different dimensions from other researchers that support Hofstede's culture dimension in other ways. Each of the researchers that added views and idea on this dimension but did not mention how to capture learner's culture when developing systems or e-Learning systems. The analysis from the diagram indicates gaps on the part of the existing framework. To this study, e-LSDF serves as the remedy to bridge the current gap. National culture can exist in any side of axis in the dimension, detailed parts of the dimension is discussed after the diagram. The diagram itself shows a compiled culture framework from different sources. The outlook shows the five

Hofstede's dimension as noted together with inputs from other researchers on the very dimension from 1980.

	Masculinity/ Feminity	Individualism/ collectivism	Power distance	Uncertainty avoidance	Long-term orientation	Other
Hofstede (1984) Hofstede (1991, 2001)						
Inkeles and Levinson (1969)*	Conceptions of self		Relation to authority	Primary dilemmas or conflicts		
Triandis (1995)						
Chinese Cultural Connection (1987)	Human heartedness	Integration			Confucian work dynamism	Moral discipline
Clark (1990)*	Relations to self		Relation to authority	Relation to risk		
Trompenaars (1997)	Neutral/emotional	Universalism/particularism Individualism/ communitarianism			Attitudes to time	Specific /diffuse Achievement/ascription Attitudes to the environment Paternalism
Dorfman and Howell (1988)						
Schwartz (1994)	Mastery/harmony	Autonomy/conservantism Loyal involvement/ utilitarian involvement	Hierarchy/ egalitarianism Conservantism/ egalitarianism			Discussion of a third dimension 3 deferred National heritage/culture homogeneity/belief system/ consumer ethnocentrism
Smith et al. (1996)						
Keillor and Hult (1999)						
Steenkamp (2001)*		Autonomy/collectivism	Egalitarianism/hierarchy	Uncertainty avoidance	Mastery/ nurturance-	

Figure 2.5: Comparison of Hofstede's cultural dimension (framework) with other models ***(adapted from Soares, Farhangmehr and Shoham, 2007)***

To begin this discussion, Hofstede's six cultural dimensions have been applauded by many for providing the fundamental base for cultural framework crossed-cultural, but have been criticized (Soares et al., 2007). From 1980 till date, Hofstede's works on national and organisational has received massive citations from other researchers according to Google scholar. From the beginning, his six cultural dimensions were based on the role of culture on organisational and national culture (Bergiel, Bergiel & Upson, 2012). Inversely, there is no place for how these dimensions will be captured in the development process. For this reason and purpose to the study, this section highlights the weak part of the dimension which will be ratified with this study framework. The following is the discussion of the five dimensions:

Individualism-collectivism: This illustrates the link between an individual and culture. Individualistic culture emphasises how individuals look after themselves, family members and relations while the group members look after individuals while loyalty is seen as collectivistic (Soares et al., 2007; Bergiel et at., 2012; Mooij & Hofstede, 2010). An individual depends on societies while societies changes through individuals and vice versa. Its deals with how to identify individual understanding and link among them in a context. Though collectivist culture oversees individual and group culture, highly cultured individuals will also misunderstand the

society. For this study, this dimension can be regarded on societal changes that impact upon learners in the environment in e-Learning systems, these cultures are framed on e-LSDF.

Uncertainty avoidance: Uncertainty avoidance shows the situation when people feel unhappy, 'threatened by uncertainty, unknown and ambiguity around them' and seeking ways to resolve them (Soares et al., 2007; Mooij & Hofstede, 2010). Instead of uncertainty, individuals prefer organised risk in the culture (Bergiel et al., 2012). However, this dimension focuses on establishment of standard attitude and behaviour through which individuals can remain oriented in a given environment through the power to understand uncertainty and risk around them. For this study, the inclusion of e-LSDF assists in resolving societal issues and risk confronting e-Learning system development and usage at large.

Power distance: This dimension deals with the effect of societal inequality in authority and power (Soares et al., 2007). It is the way the less privileged individuals in the society see power and position as unequal (Mooij & Hofstede, 2010). According to Bergiel et al. (2012), through this dimension, inequality in society is regarded as normal by less powerful individuals in a high powered distance, but respect is observed from lower to top and opposite on lower powered distance. The sequential arrangement and segment of power and dependence is seen in this dimension. The imbalance in the position in society can be realised in e-Learning when only individuals who understand the language of the developers can benefit using the e-Learning platform. From the problem statement in the previous chapter, it was identified that most e-Learning systems were developed in the developers' language and this placed users in dichotomy. Now, the implementation process in consideration of power distance will help in eliminating inequality across learning class through the development of culture-oriented e-Learning system.

Masculinity-femininity: The common things in 'masculine countries are achievement and success (Mooij & Hofstede, 2010) while in feminine countries, caring for others and qualities of life are the focus' (Soares et al., 2007). Masculine individuals are success-oriented while feminine individuals and societies are aide givers to others. For Bergiel et al. (2012), masculinity cultures are those that regard male dominance while femininity are female cultured dominance.

Long-Term Orientation (LTO): This deals with how people in a society up-hold their cultures and traditions toward the future. The dimension regards "instant reward versus delayed

reward" as preference (Bergiel et al., 2012). It also sees society as more future focused than short-term (Mooij & Hofstede, 2010; Yoo, Donthu & Lenartowicz, 2011).

The facts from these cultural dimension shows the extent to which this dimension interacts with individual culture in a nation and organisation. This study covers extensively the role of culture in the organisation as earlier stated. However, these dimensions can be used together with this study to streamline the role of culture, integration and even in an organisational system development. In the design and implementation of the e-Learning framework, the literature suggests the difficulties in finding a comprehensive framework for e-Learning (Lee, 2013). Rather the failure to couple the whole process has been a daunting task. The overall framework should enable developers (content and system), instructors, course directors and other stakeholders to understand the e-Learning development process to attain its mandate (Lee, 2013). The attainment of e-Learning goals depends on the learner's cultural-environment, through this study; learners' cultural-background is well understood and is accommodated in different variations, moving technological learning forward, and enabling learner system to be culture-oriented. Lee relates the effort as 'research-based practice and practice-based research' in executing e-Learning system. Though e-Learning is busy gaining needed ground throughout educational sectors across the globe, including SA, but e-Learning is facing difficulties in designing user-oriented interface (Lee, 2013). The last statement shows crisis and negligence that remain unsolved in e-Learning in accordance with this study. These difficulties can be addressed through this study framework by understanding and embedding all the components of Hofstede dimension into the development of e-Learning systems and making the systems more culture-oriented. In summation, the entire components of Hofstede's dimension can be analysed along the development line to understand learner's cultural differences and assimilate them in the development. But the fact remains that the current systems are not Hofstede's dimension-oriented.

2.3.2.2. Khan and other e-Learning framework

E-Learning framework is coined on ecologic opinion and the quality of constructivist environment in focus to 'pedagogical design, architecture, the environmental context and what is actually learned', it allows for easy adaption and interaction with the information in the physical learning environment (Zualkernan, 2006). Few researches exist with active framework to address e-Learning and pedagogy challenges (Mehanna, 2004). This study works around this inadequacy in coming up with a branded framework to capture missing features in existing frameworks in the like of Khan's framework through e-LSDF. Learning is not carried out

through passive method, but through learner's active participation as viewed by the constructivist platform. Constructivist learning environment is effective with Scio-cultural integration. Zualkernan (2006) believes on the vitality of "Scio-cultural" learning activity through flexible development. According to Zualkernan (2006), constructivist authentic learning environment is an environment that comprises those features that testify to how people learn. It is also a learning environment that provides supports, expertise, advanced performance, multiple support and prospective learner (Zualkernan, 2006) and it also affirm knowledge collaboration, reflection and conjunction.

The environment coaches and provides learning materials for the assessments of learners in the field; it also focuses on professional difficulties resolution with deep understanding of real features in a learning environment. Culture should be the main factors in e-Learning framework as demonstrated in the framework diagram (Figure 2.6) below. The learning mood of individuals is influenced by their culture and values. Through constructivist authentic learning, learners are closer to culture-oriented, and learners assimilate better in a local content. According to Andersson and Grönlund (2009), symbols and signs used in e-Learning should be local content-oriented. Lee (2013) believes that e-Learning system design should be able to meet needs in a successful implementation, analysis, curriculum design, design of contents and development, management (course and personnel), feedback and evaluation. Much comprehensive needed e-Learning development environment is not yet established but learners and teachers do agree that technology can increase learning standard and pedagogy principles which are difficult to be integrated in e-Learning design (Lee, 2013).

Achieving good success in e-Learning is seen as difficult when the interaction and structure to engage individual to be an independent-learner is isolated from the design. The ability to present a learning system which is culture-oriented will eliminate such gaps. The more learners are able to be individual-thinkers around their context while using e-Learning, the more one can say that e-Learning has achieved its mandate. The consideration of structure and interaction ensures e-Learning systems as fully executed and holding its mandate on culture. According to Lee (2013), e-Learning interaction is grouped into 'student-content, student-lecturer and student-student' learning process while structure is centred on execution and management. Interaction and structure are sequentially interacted on e-Learning system for full functionality of e-Learning, however, both are unavoidable. The diagram below provides the position and role of culture in e-Learning and the link and interaction between each component in e-Learning structure.

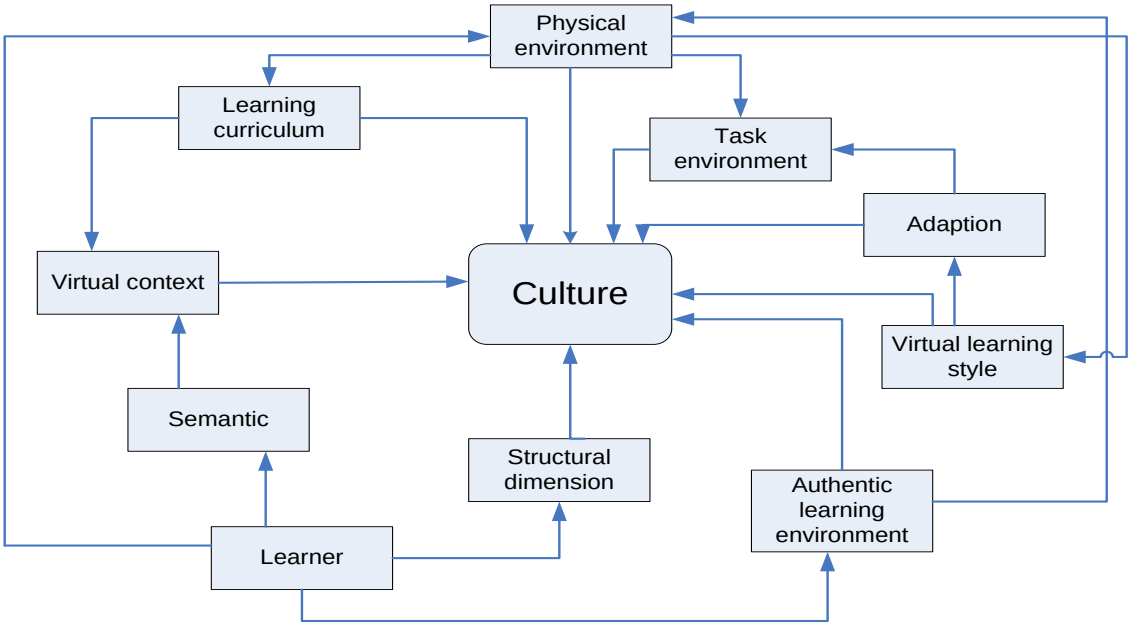


Figure 2.6: Framework for developing e-Learning *(adapted from Zualkernan, 2006).*

The overall illustration from the framework highlights the central role of culture at the heart of e-Learning platform. All the components in the diagram lay on culture to function efficiently; this means that the presence of culture is paramount in e-Learning functionality to the study. Let's discuss each of the components in detail below:

Physical environment: It is an observable feature of the framework. The characteristics include contents like study guides, manuals, textbooks, interactive database, learner, tutors and experts (Zualkernan, 2006). Some characteristics require special features that learners have to perform. Learners can perform a task effectively when it is important in the physical environment, but for this to be realised online, e-Learning system should be culture-features that are implementable. Furthermore, from this framework in the study, the content of the physical environment can be customised to one's language and culture in order to deliver needed result.

Task environment: This is a subset of the physical environment that is important to agents like medical practitioners. The use of a task environment in the framework shows what a learner can learn under constraint task environment which restricts learner capacity (Zualkernan, 2006). The constraints can be under student learning manner, understanding capabilities, limited memory, analytical skills, holistic, independent/dependent field, doubled comprehension, objective, vision, goals and motivation.

Adaption: This is the major feature in the construction of framework. It's a concept that assists in constraints of task and the learner environment. Adaption does not happen overnight or out of the blue. Rather it happen over time and continually, however, it should be active and flexible that learners can easily fit into special task environment (Zualkernan, 2006). "Fit" shows or determines how learners adjust to the task environment. For learners to fit into the learning environment, the role of culture and its recognition must be determined. Fit can be categorised into semantic and structural dimension (Zualkernan, 2006).

Semantic – It determines how actions of learners assume or adopt into a specific environment. It also shows how learner goals and objectives are actualised in a physical environment. The actualisation process depends on how rooted the e-Learning framework can be. The framework will ensure whether making this actualisation can be possible through the study.

Structural dimension – Its shows or determines how construct and learning manner of learners is structured into the information in the environment. Structural dimension can fall when learners refuse to accept information from the environment as useful in the task environment (Zualkernan, 2006). This study fits in on this dimension because the mandate of this dimension is what the study is advocating in capturing culture and presenting cultural ideas and knowledge of learners on the e-Learning platform.

Authentic learning environment: This is a "constructive tradition" positive that assists learners to manage their individual knowledge in the task environment (Zualkernan, 2006). It is a great way to solve real-world problems in the e-Learning environment. The authentic learning environment testifies "learning curriculum" in the framework and e-Learning. Learning curriculum assist in attaining inter-degree between learner and the task environment (Zualkernan, 2006). Together with this section, e-LSDF will automatize the learning environment allowing for the influence of culture in the curriculum. A standardised authentic environment has four sets of opportunities "4 tuple" (I, A, C, G), according to Zualkernan (2006), the four letters ensure that effective e-Learning system is framed in e-Learning.

I – 'Information in the learning environment;

A – 'Successful action in the learning environment;

C – "Cognition constraints and learning styles of the learner"; and

G – "Goals and intentions of the learner".

Although a good authentic environment ensures that adaption of the learner at all-times both on structural and semantic fit, it also ensures validity so that environmental adaption will firstly be tried in a real-world environment (Zualkernan, 2006). To this study, the above four letters combine both semantic and structural dimensions into one e-Learning development.

Culture: It is centre point for virtual-learning. It is the centre strength for e-Learning where all features and components are linked together, because culture is influential in learning. However, the above framework can be implemented to strengthen and position culture at the heart of e-Learning development in driving effective learning.

Learning curriculum: Curriculum was coined from the Latin word "currere" meaning "to run" (McKimm, 2007). This shows that curriculum aim to provide "template or design" that structure and integrate the teaching and learning environment (McKimm, 2007). Learning deals with the process of skills and knowledge acquisition while curriculum is concerned with structured learning materials aimed to accommodate individual learners. Learning curriculum aims to present learning materials in a documented manual. Furthermore, curriculum shows things to know in the learning course or programme and provision assessment methods and others. Learning curriculum is delivered electronically via different media including e-Learning, and culture-oriented platform is needed to position curriculum in achieving its mandate. Through this study, cultured learning curriculum can be achieved through the presentation of learning curriculum in a cultural way in order to gain trust from the users.

Virtual context: This is a learning material in an electronic learning environment. Seeing that e-Learning is centred electronically these days, virtual context is the actual learning platform on which e-Learning depends in a virtual learning environment. The context involves teachers and students. The important role of this section brings the recognition of the virtual context in the learning environment in total. On the account of this study, the attachment of culture-oriented context will make e-Learning more comprehensive.

Learner: A learner is main user of e-Learning system. Barik and Karforma (2012) believe that learners are final users of e-Learning system in accordance with Wagner, Hassanein and Head (2008). These final users operate in an environment that is flexible, and so learners' concern, culture and needs are to be top priority in any phase of e-Learning design and implementation. To engage learners in the process, cultural factors should be regarded in the process.

Virtual learning style: Every learner using e-Learning has learning style that suits him or her. E-Learning users consider preference at all times, and suitable virtual environment that

captures users' general and basic grassroots helps for knowledge assimilation in the virtual world. The above framework aims to present a learning framework that users can be comfortable with in the learning process. It is also a framework that is tried in positioning e-Learning design development process to be design-oriented. In accordance with this study, the actual learning comfort is recognised as a way learners can study well in the learning context.

However, Khan's e-Learning framework can be an ideal framework in presenting, positioning, directing and guiding e-Learning content effectively (Patrick & Barton, 2012). A number of issues need to be addressed in optimising e-Learning benefits and good investment return. Khan's e-Learning framework can be an answer to ensuring that organisations and individuals implement rewarding e-Learning environment that is initiated (Patrick & Barton, 2012). Khan's framework is used in this study to present the height that the framework has tried in combining components that can enhance e-Learning systems over the years. Khan's framework is divided into nine points (dimensions) as seen in the diagram below.

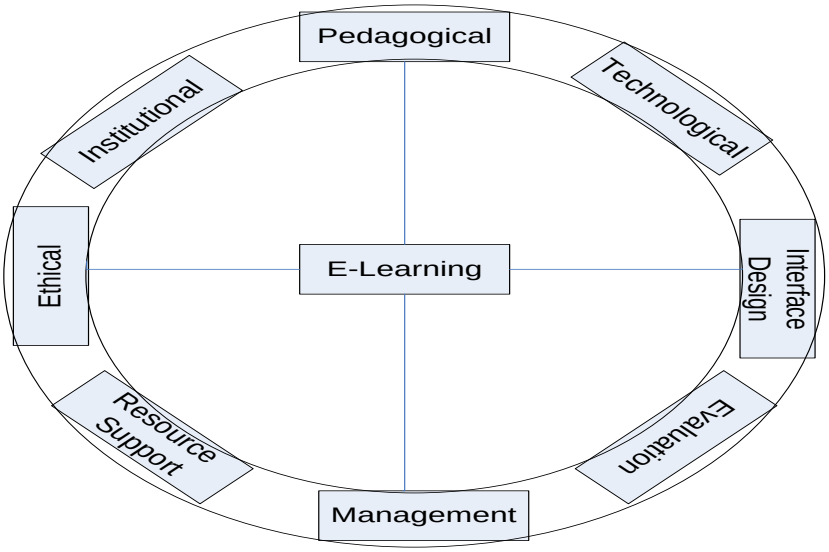


Figure 2.7: E-Learning framework from Khan's *(adapted from Patrick and Barton, 2012)*

Khan's e-Learning framework has 'e-Learning, institutional, pedagogical, technological, interface design, evaluation, management, resource support and ethical dimension', and every dimension presents a vital point that could make e-Learning system a success (Patrick & Barton, 2012). The framework is structured in circle; it implies different issues and components that surround e-Learning execution. The dimensions are explained below:

Institution dimension: Its deals with issues like administrative concerns (budgeting, institutional infrastructure, marketing, IT services and others), "student affairs" (like course

arrangement, registration, library and IT support, tutorial service and many more), "academic affairs" (examples, staff support services and so on) (Patrick & Barton, 2012: 4). This dimension covers expensively the functionality of e-Learning execution in education institutions. With its coverage, culture-orientation should not be downplayed but rather considered in all these functional tasks attached to the dimension.

Pedagogical dimension: Its deals with teaching and learning in regard to course contents, aim, goals and objectives of the learning, learning methodologies and others (Patrick & Barton, 2012). It also focuses on benefits on all issues associated with design and implementation of e-Learning platforms (Patrick & Barton, 2012). For this reason, pedagogy needs a boost in order to design an e-Learning system that can accommodate different learner cultures. To attain this expectation, the study will try to make these expectations possible through e-LSDF consideration in all phases of the development of the e-Learning system.

Technological dimension: This dimension talks about hardware and software infrastructures and all-over technological infrastructures (Patrick & Barton, 2012). The infrastructure is the platform where e-Learning systems and other systems operate.

Interface design dimension: Its illustrates and focuses more on the "look and feel" of the e-Learning system, example content design, page/site design, colour, link, navigation, the flexibility and testing (Patrick & Barton, 2012). E-Learning should be user friendly in order to be used in an effective way as possible while the needs and expectations of end-users are integrated into this dimension. To this study, each of the contents should be culturally constructed in order to relate to learner culture and background.

Evaluation dimension: Its focuses on the e-Learning system's effectiveness and learner progress evaluation (Patrick & Barton, 2012). Feedback brings out the best from something and through this dimension; users are able to voice out what they expect to see in the e-Learning system design.

Management dimension: This dimension deals with maintenance issues on the e-Learning platform and information circulation like email, notification, appointment booking and others (Patrick & Barton, 2012).

Resource support dimension: According to Patrick & Barton (2012), this dimension deals with technical, institutional, and support in regard to online and offline support.

Ethical dimension: It concerns learners' social, economic and background diversity, breaking the digital-divide by making content accessible to all "e-Learning protocol" and legal concerns (like copyright, privacy and plagiarism) (Patrick & Barton, 2012). Through this study, indigenisation of learners is to be represented in the modern e-Learning system to accommodate users. In summation, pedagogy is a blueprint in learning and positing and bridging the gap between culture and e-Learning systems. To this study, Khan's framework is comprehensive enough but not on cultural factors that make learners actively relate e-Learning contents with their cultural platform more or less on capturing culture. This can be regarded as a weakness on the side of the framework.

E-Learning framework benefits:

An e-Learning framework ensures that factors vital to the successful implementation of e-Learning platform are considered (Patrick & Barton, 2012). However, the benefit could be realised in the following ways (Patrick & Barton 2012), but not limited to the following:

- ✓ It Improves collaboration, link and communication across all entities.
- ✓ It could improve effective and efficient return on investment and decrease effect and resource duplication.
- ✓ It provides and improves effective direction for organisation future skill advancement in education and open-up to global market recognition.
- ✓ It presents a model for future development.
- ✓ It lays a road map in the design of e-Learning for others to follow.
- ✓ It bridges gaps between design and applications.

However, according to Patrick and Barton (2012), multimedia is based on Khan's e-Learning framework that aims at effective web-based learning tools/system. The effective execution of e-Learning involves theories as fundamental fabric in e-Learning adaption.

2.3.2.3. E-Learning theories

E-Learning has gained much attention globally, but few literatures exist on the theory, the existing ones being mostly descriptive or ethnographic studies (Nichols, 2003; Andrews, 2011). Few researches show challenges on the part of e-Learning, and an underpinning theory is needed with detailed discussion. According to Nichols (2003: 1), literature can be seen as a "tree of knowledge", practice-based research is considered as "branches of the tree" while the theoretical base is the root. Root is the fundamental axis for the survival of branches, however, the more attention given to e-Learning theory, the better and effective it will be. For this study,

ignorance of theory means limitation on e-Learning design process (Nichols, 2003). Theory can aim to produce desired e-Learning objectives for the use of the study; e-Learning objectives can be achieved through inclusion of learner culture features. To this point, theory can be defined as a measure for accessing practice, but the literature is inadequate on e-Learning theory (Nichols, 2003). However, it provides a logical sequence structures that link and guide the development for practitioners and researchers use. To this study, theory can be seen as an underlining philosophy to execute an event, the event here is e-LSDF.

Nonetheless, the main missing link is on theoretical frameworks, technical, social, cultural alignment, policy and organisation phase that integrate in the field (Andrew, 2011; Andrew, 2003). The exclusion of these phases limits the potentiality attached to e-Learning; this study will try to address these limitations. Furthermore, theory can only be tested when available; according to Nichols (2003), e-Learning systems will not be able to expand if proper and specific theory is not implemented. The ISD is a fundamental rooted pillar for the design of institutional solution. The ID presents a learning framework (Wang, Brown & Ng, 2012), the effectiveness of which is dependent on design and analysis of outcome-oriented content to achieve learning goals (Wang et al., 2012). The use of this framework also depends on the kind of theory in place.

However, according to Wang et al. (2012), there are limited generic models that handle instructional solutions in accommodating various learning goals. Meeting e-Learning mandate means having a framework that streamlines the gap between learning context, technology and learning in accordance with this study. The use of the ID model in e-Learning design realises the inexistence of learners in a traditional classroom for the teaching-learning process (Wang et al., 2012). For Wang et al. (2012), the e-Learning design process mostly uses Gagne's theory. The process consists of nine critical points, example, "gain attention, inform objectives, stimulate recall, present stimulus, provide guidance, elicit performance, provide feedback, assess performance, and enhance retention and transfer"; they all ensure effective implementation of e-Learning (Wang et al., 2012: 5). Nonetheless, Wang et al. (2012), there are many other e-Learning theories available, but the following three are popularly used: Constructivism, Behaviourism and Cognitivism, which is the focus point of this study.

Constructivism: It is an application that gives learners the platform to design their own e-Learning system solution (Wang et al., 2012). However, Piaget, a Swiss psychologist framed this theory which it is a theory on how human senses and intelligence are developed, and the

development is based on the information in the environment. Koohang, Riley, Smith and Schreurs (2009) and Alzaghoul (2002), define constructivism as a new active knowledge construction based on learner's previous experience. This illustrates that learning is active and students are able to construct their own knowledge through personal-reflection on what to learn and on what was learnt.

But according to Wang et al. (2012), this theory in order to be consulted in the design of e-Learning for "constructivist learning environments" for the full involvement of students in the process and post-development processes. Alzaghoul (2002) believes that this theory is good for e-Learning because it engages with the learners, however, peak number of pedagogies uses constructivism, which ensures that teachers and learners are in collaboration with each other. The engagement also involves the environmental components and others. Using this theory means integrating all these features into one framework. The study articulated the benefits of this theory into the framework ensuring that e-Learning is student-based.

Behaviourism: This theory believes that learning behaviour change is influenced by the external context (Alzaghoul, 2002). The change in learning is associated with outside impact upon, and the level of e-Learning usage heavily depends on learners' cultural considerations and ability to relate what is learned in social contexts. Behaviourists believe that 'observable behaviour' only shows that a learner has acquired knowledge and how the knowledge can be applied (Alzaghoul, 2002). If learners are influenced by external forces or factors, then, it is ideal to capture such factors when designing e-Learning for the benefit of easy usage.

Cognitivism: This is sequential change or restructuring of individual knowledge and ability to adapt to changes quickly and possible in the learning process but much more in e-Learning (Alzaghoul, 2002). Cognitive paradigm believes that learning involves the use of "memory, motivation, and thinking, and that reflection plays an important part in learning" (Alzaghoul, 2002: 28). In this paradigm, learning takes place intrinsically and with ability of learners to reflect while reading. Cognitism is vital for learner's differences and different learning styles in e-Learning in housing those differences (Alzaghoul, 2002). The ability to house differences and measurement shows common interaction of the learning context. This study is able to house these differences.

2.3.3. The link between e-Learning, online learning and distance learning/education

The following terms, 'e-Learning, distance education, distance learning, online learning, distributed learning' and web-based learning are interchangeably defined in accordance with

The Pew Learning and Technology Programming in the United State of America (USA) (Guri-Rosenblit, 2005). The characteristic of e-Learning is not just distance, Internet or computer. The central point of this study revolves around e-Learning which needs an in depth clarity and explanations and also the other key terms mentioned above for proper formulation of this study framework. The purpose of the section is to showcase the role of all these platforms in this study, and the main users. So, e-Learning operates using different platforms like online-Learning, distance learning/education and networked learning. Its aims to bring collaboration between learners, lecturers and learner communities and environment (Barik & Karforma, 2012). This shows that learners can access learning materials and gain college or university qualifications anywhere around the globe and e-Learning is operational in the learner's context.

Learning is seen as life-long process from birth to death and this long-life means the provision of a chance for training and education which allows people to gain and update their existing skills and knowledge. It also brings about limitless learning and content sharing (Arkün & Akkoyunlu, 2008). This life-long learning compels anyone to learn anytime and anywhere. In accordance with research study, the continuity of learning can be better off if the learning is invoked in the learner's culture and becomes familiar. Nevertheless, the initiative of how to power e-leaning toward contributing to teaching and learning using technology is the aim of Partnership for Higher Education in Africa (PHEA) in an effort to address educational challenges (Jaffer, Ng'ambi & Czerniewicz, 2007). But this aim may have a short fall by the way side as a result of the inadequacy of engaging and designing learning contents which are cultural or lack culture-oriented framework. The learning space combines the following methods: four-wall classroom, informal and formal learning space, virtual classroom or online learning space and blended-learning or distance contacts. There is also a link between society and technology; both coexist in societal transformation using different media (Jaffer et al., 2007). Such link can be tagged porous as a result of the disintegration between context factors and e-Learning; however, the association of culture in learning technology inversely incorporates culture into e-Learning development bridges as a gap between e-Learning systems, the environment and the users. Figure 2.8 illustrates the amount of interaction and the intermediate role of LMS among the above discussed platforms or application and learning and education in general.

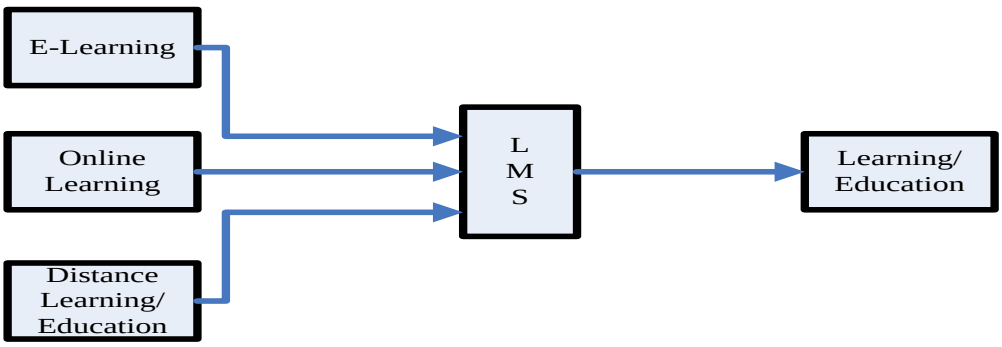


Figure 2.8: LMS interaction with other learning applications.

Each of these applications on Figure 2.8 is commonly bind around LMS to affect changes and advance better and easy learning for all. The LMS indicates its central role played as a base for other applications to be dependent upon.

Furthermore, e-Learning system for education purpose is not the only means for knowledge acquisition but also for skill adoption in a changing society. This can be supported by Cognitivism theory and education is influenced by global communication patterns in the "information society" (Jaffer et al., 2007). The pattern influences different aspects of e-Learning, online learning, distance education and others, but for the influence to be positive, an innovative framework is needed. However, ICT enables education to go borderless with open opportunities and market for learners, ICT is an agent for change and support to boost access to academic service especially in e-Learning arena, though e-Learning provides more study material access point now than before. This support cannot be possible without a structural framework that is embedded in a learner culture which is the area of concern for this study. The sections that follow provide detailed explanation of e-Learning, online learning, distance education and web-based learning and their role in this study, but all of them have many things in common.

2.3.3.1. E-Learning

The history of e-Learning can be traced back to the 1840's when Isaac Pitman taught shorthand to students through correspondence (Epignosis, 2014). From the early days of e-Learning till now, a lot of evolution has taken place. There is an increased number of literature on e-Learning; such has been on how to use it to effect teaching, but few on implication, implementation, technical and others (Andrew, 2011). But for the purpose of this study, e-Learning is presented at this level to show the actual platform where this study framework will be implemented.

From the inception till date, e-Learning has evolved through the potentiality of the Internet. However, before Internet was launched, teaching and learning have been offered to students behind four-walls with the involvement of distance education or study by correspondence (Epignosis, 2014). Again, the early e-Learning system was aimed to offer students with learning skills and knowledge, but in the early 70's, e-Learning systems became more innovative (Epignosis, 2014). The history and inception of e-Learning is also aimed to facilitate correspondence learning and making learning quickly accessible to learners across the board and accommodating cultural differences. However, e-Learning involves learning as noted; learning can be seen as the process of gaining information with the ability to increase skills and learning-knowledge (Epignosis, 2014). E-Learning rotates from the inception of computer network in education with the potentiality to improve blended-learning in combination of classroom learning with the aid of computerised tools (Nagarajan & Jiji, 2010). As Barik and Karforma (2012: 51) put it, e-Learning is seen as "Student, Teacher and Controlling Authority", application for different purpose, and a well-designed e-Learning system needs integration and engagement among users. The ability to control and engage among stakeholders heavily depends on the cultural role on the platform and this is what the study stands for.

As Nagarajan and Jiji (2010) put it, e-Learning is defined as a combination of electronic media in learning and it excels in reflection on learner preferences. The reflection can be based on the culture of the learners for easy understanding of learning materials. According to Sun, Tsai, Finger, Chen and Yeh (2008), e-Learning is the delivery of education or learning content using ICT. E-Learning can be seen as a new media learning platform, it involves many functions that aim to replace classroom-based or face-to-face (FTF) teaching and learning (Guri-Rosenblit, 2005). Wagner et al. (2008), Nagarajan and Jiji (2010) and Barik and Karforma (2012), state that e-Learning is engaging in activities via Internet, not only for delivery or on digital technologies but for participants' interaction using audio, videotape and TV, CD-ROM, live virtual learning, chat rooms, satellite, discussion room, intranets, Web-based courseware and extranets. However, an e-Learning course involves 'Internet technologies, E-business, Computer and Online simulations, Mobile computing, and Internet marketing' (Despotović-Zrakić et al. 2012). Furthermore, e-Learning is a game changer in the learning space; it provides active access to immediate skills, information and knowledge and ability to distribute behind the borders of classroom walls anytime and anywhere (Nagarajan & Jiji, 2010). At this point, the objective of this study is clear about the delivery of e-Learning within a learner's context. The delivery of e-Learning mandate is not in doubt but the issue of concern is whether the

mandate has reached main the stream of students? The mandate is incomplete in the absence of culture-oriented framework.

At this time, of the growth of ICT, e-Learning application is emerging as a new paradigm in order to present learning. The application is quickly changing the methodological platform of education (Barik & Karforma, 2012). The Food and Agriculture Organisation (FAO) of the United Nations (2011), defines e-Learning as delivering of learning material across different users through computer and Internet for performance improvement. According to Tsai and Machado (2002), e-Learning is a coincident learning with the use of computer and other network components; however the computer is not a central point in the learning process, but network interacting with the computer in the learning process and working with educational materials. The interaction exists in the learning tool and at this point, this study defines e-Learning as the use of technological medium positively impact upon teaching and learning in a framed platform.

The platform is designed in an environment where learners coexist with culture. Furthermore, e-Learning is moving completely from 'mixed-mode or blended learning (face-to-face learning mode) to online learning (virtual learning mode)' which results in flexible learning (Jaffer et al., 2007). Technology enables flexible learning that can only be possible through access to technology by teachers and learners; this can be influential to institutional infrastructure.

According to Nagarajan and Jiji (2010), the new market created by e-Learning also elated changes in government policies and regulation, for example, European Commission launched "employment strategies" to spread e-Learning for all. E-Learning is considered as a new trend, but many people even in the academic fraternity are not fully acquainted with the innovation around it (Carabaneanu, Trandafir & Mierlus-Mazilu, 2006). For this study, the acquaintance with e-Learning usability depends on the friendliness of the system and the possibility relies greatly on the incorporation of cultural features based on this study objectives. However, from the literation studies gathered, it is proven that representation and capturing of culture is not associated with the widely designed usage of e-Learning. In the time past, the keyword, "technology-supported learning, distance learning and web-based training to e-Learning" were used, presently, e-Learning is widely used, its enhances connection and resource sharing and exchange of knowledge and ideas in higher institutions and also enables organisations to deliver information to the right audience at the right time and place (Carabaneanu et al., 2006: 106).

The future of e-Learning remains promising continually. From the above definition of e-Learning, the common terms aim to positively affect education. The e-Learning replacement of (FTF) education means that are innovative framework is needed because the feeling and personal understanding of individual learners should be accommodated, as this study aim to design cultural-oriented e-Learning framework. In this regard, the definition of e-Learning brings about terminologies and viewpoint of some researchers. Nonetheless, according to this study, e-Learning is a systematic learning boosted with the aid of computer network and Internet across geographical boundaries, including educational institutions, organisations and individuals. A physical classroom is not necessary in this kind of learning, but learning materials and support are delivered in the Internet for learner's easy accessibility anytime and anywhere. It can be summarised as asynchronous-synchronous learning process in this study. It depicts different learning tools used impact upon the teaching-learning process.

2.3.3.2. Online learning (OL)

Online education ideology has been conceptualised due to the impact of Information Technology (IT) on distance educational teaching and learning, although, IT is seen as the economic result of the advanced traditional teaching platform (Al-Khanjari, Kutti & Hatem, 2006). However, online learning can be difficult to differentiate among other forms of learning like distance education and distance learning. Some researchers regard online learning as total learning and others as learning using technology channel or electronic-environment where learning takes place (Moore et al., 2011). For this study, it is the use of virtual platform to facilitate the learning process. The purpose of the section in this study is to show other aspects of e-education that can utilise this framework. Although, online learning is widely concerned with easily and over-readily reachable learning content on a computer, learning-materials can be conducted on the Internet, or using CD-ROM and hard-disk (Tsai & Machado, 2002). This study can be applicable to any level or form of e-education platform including online learning.

But, according to Benson (2002) and Conrad (2002), online learning is an improved edition of distance learning with effective access to educational chance, better connectivity, innovative and flexible interaction between learners and teachers (Moore et al., 2011). The study uses this definition to apply to this section because the definition has managed to combine various activities that can be carried out using online learning. In the near future, online education powered through Internet connection will be the prevailing method of learning around the globe (Radović-Marković, 2010). Nonetheless, online learning is growing year-by-year without Internet technology. For the future forecast to be realistic and attainable, integration of this

study objective with online learning is paramount seeing that educational learning is cultural dependence. However, more detailed literature on this section is found in the Appendix. Figure 2.9 below demonstrates the flow of learning information from teacher to learner and the link between them online using the middle agent.

Figure 2.9: Online learning structure

Conclusively, online learning can contain the border of synchronous learning environment. Teacher or lecturer is a centre role-player on the platform in the provision of synchronous learning components. But the process is conducted via network or internet and e-Learning is already made content online.

2.3.3.3. Distance learning/education (DL/E)

Moore et al. (2011) state that distance education or Distance Learning (DL) is interrelated with online learning with no further descriptive difference among them in any way. Both can be interchanged because they have similar components. Distance learning/education and teaching in university is characterised by the reverse "campus-based university". Distance learning is the oldest form of distance geographical learning platform ever conducted over the Internet; network and computer can be excluded but the distance interaction between teacher and learner is well encouraged (Tsai & Machado, 2002). In education, the popular term known to people is distance learning or distance education, but the emergence of web-based learning has given new meaning to this kind of teaching and learning. The elevation of e-Learning is an advantage to learners in having access to knowledge and information anywhere, anytime and anyplace on self-control led based (Carabaneanu et al., 2006). According to Selznick (2013), distance learning is becoming a vital education delivery tool across online or communication. As a delivery tool, its increases access to education and youth empowerment economically in the 21st century. Research has shown that learners in developing countries use distance education as a result of the inability to secure admission for campus based education (Sanga, 2013). In an effort to bring education activities to the door-step of campus disadvantaged students, the Open University of Tanzania (OUT), for example, use this medium to increase access to higher education outside the university four-walls (Sanga, 2013), and other education institutions around the globe. Distance education or learning closes the knowledge gap among individuals

and nations. For the purpose of this study, distance learning is discussed to show another form of education conducted outside an education institution's four-walls that can adapt e-LSDF principles to impact upon teaching and learning. To understand the literature on distance learning/education, more information is presented in the Appendix.

For this study, distance learning is asynchronous learning environment in which learners use distance (correspondence) studying on self-dependence. Distance is the main factor that separates all the stakeholders from each other and work from different parts of the globe at own pace. Each learner's independence shows that some factors influence the way learners interact or assimilate learning in its totality. The awareness and introduction conciseness of the culture of the learning context is treated as a matter of importance. So the framework of this study should be regarded as distance education at any level of development.

2.3.4. e-LSDF

The logic to create flexible e-Learning system is based on Khan's e-Learning framework in order to structure a system with the right content which is available to the right audience at the right time (Patrick & Barton, 2012). E-LSDF was initiated after some literature on e-Learning framework on culture was analysed, example, Hofstede's dimension (2.3.2.1) and Khan Framework (2.3.2.2). The choice was based on the inefficiency on both frameworks to recognise learners' culture and how it can be managed and captured in e-Learning system. Putting out the right structured framework fairly depends on how it is rooted framework and its ability to capture what learners are able to relate to in the context. As earlier stated in chapter one, some researchers have shown interest in the importance of culture in IS design which dates back to the 1970's and other popular types of literature on the role of culture on IS design (Kummer et al., 2012). The notable literature in this regard is that of Hofstede's (1980) cultural dimensions which solely focused on the national, organisation culture role. Now, the dilemma is that the researched literature on framework lacks culture-oriented elements to capture culture. Learners and learning materials or tools exist in an environment and the environment can be culturally influenced and controlled. e-LSDF is an ideal framework to facilitate good quality an e-Learning system that can be used to promote effective learning environment which will transform into a good learning outcome. In support of education through e-Learning, social software can facilitate such process. Social software (SS) is a piece of software that people use in information sharing through computer connectivity (Attwell, 2007). It allows for flexible content sharing and change adaption, its offers the privilege for learners to be knowledgeable

and idea creators, meaning that learners can become more knowledge producers (Attwell, 2007; Young, 2007) than consumers.

So, the use of e-LSDF framework will be to standardise e-Learning development model that will assist to address some of the software crisis that has disadvantaged e-Learning development with regard to culture ignorance or negligence in the development. The e-LSDF will also serve as guideline during the development of e-Learning system. The innovation circle in the computer-aid learning has given birth to blended-learning programmes. According to Carabaneanu et al. (2006), blended-learning is the combination of traditional learning with e-Learning, this combination is aimed at advancing teaching and learning technique, for single learning techniques are not really delivering teaching and learning mandate to all cultural and border learners. Blended-learning can be advantageous in the sense that its increases learning option for learners.

2.3.5. E-Learning pedagogy and framework

One can say that ISD is in a crisis of complexity, reusability and scalability (Dehbi, Telea & Tragha, 2013). One can query the theories, framework and methodologies used in ISD and why it is still not addressing this crisis after so many researches to combat the crisis. The aim and objective of e-Learning technologies should be to develop and implement a system that can be suitable for teaching and enabling learners navigating and delivering effective learning contents (Kolås & Staupe, 2004). The vital point of e-Learning design has been focused on administrative, content management and multimedia but pedagogical methods have been ignored. Rather, the implementation of e-Learning system depends on the pedagogical method, methodology, and framework and not only on technology for design procedure (Kolås & Staupe, 2004). For the purpose of this study, this section aims to strengthen teaching and learning in illustrating the benefits of pedagogy in the development of e-Learning.

2.3.5.1. E-Learning pedagogy

E-Learning system is a modern automation method of teaching and learning while culture-oriented learning is the higher layer of dependence on the learner's culture in development. According to this study, the development of effective e-Learning system needs understanding of learners' background and to apply this, pedagogy application should be considered. Pedagogy has been unpopular until recent (Stone, 2000). The outcome of the selected pedagogy model decides the learning success and failure, the debate on the pedagogical model suitable

for e-Learning development has pull direction from teacher-centred learning to more "learner-oriented approach", for independent learning (Andersson & Grönlund, 2009).

Pedagogy is the science and art of teaching and learning (Bhowmik, Banerjee & Banerjee, 2013). Impact upon teaching and learning involves different approaches to match all learners. These approaches are used to effect and improve students' learning standards (Bhowmik et al., 2013). For this study, the level of teaching impact upon the learner on the level of the learner's engagement with the environment. Some learning strategies are suitable in certain learners' background while others are not. They aim to understand different learning situations and contribute to quality learning in the community of integrated learning in building good and confident environment (Bhowmik et al., 2013). Pedagogical principles are student-oriented, and involve teachers and the learning environment. Pedagogy involves teaching; and teaching can be seen as a profession of individuals called teachers; the process includes tasks that assist learners to improve their knowledge and skills (Bhowmik et al., 2013). Teaching as a process occurs interactively with learners in a classroom or online and exists in an environment. The online aspect of teaching needs a framework that incorporates teaching strategies with the learner's cultural-environment. The need to merge e-Learning into pedagogy has gained the attention of researchers (Mehanna, 2004).

Furthermore, pedagogy is an instrument for the construction of interactive e-Learning system, but in 2005, Professor Anderson and McCormick defined pedagogy as 'principles of e-Learning' (John & Robert, 2005). For this study, the principle involves methodology and framework Moore et al. (2011) see methodology as a development environment. According to Patrick and Barton (2012), framework can be seen as structure that positions software program are to right audience with enough content. Through pedagogy principles are initiated and the principles used in traditional learning can be applied in e-Learning (Govindasamy, 2002).

These principles are aimed to promote structure that helps to design e-Learning system content that confirms learner's task and expectations. It can also help teachers to select appropriate materials that can make teaching and learning interacting and engaging in activities (John & Robert, 2005). Again, pedagogy can be seen as activities that structure or change experience in learning relating "technical infrastructure to course design to teaching" and learning (John & Robert, 2005). A well-designed e-Learning system provides learners with interactive role in the learning circle. Pedagogy also ensures that curriculum objectives, and continual assessment and content management are assured with enshrining social and ethical groups into learning

context (John & Robert, 2005). The role of pedagogy in this study is to ensure that proper features and characteristics are integrated into e-Learning design at all layers.

Although the e-Learning system is usually focused on limited delivery methods, the main goal should be on a variety of pedagogical methods that enable learners to choose from multiple options (Kolås & Staupe, 2004). Meanwhile, such a system can be challenging, but achievable through grounded design in learner culture.

The past decade has reviewed what works and what does not work by using pedagogical methods in e-Learning development (Kolås & Staupe, 2004). In accordance with Kolås and Staupe (2004), among many components of pedagogical methods, future pedagogical methods should allow teachers to select right application for learners' benefits during development. For many years now, variations can be seen as crucial rule in teaching and learning, but this rule seems lost in online education, but the model that allows information transfer does not consider pedagogical challenges and issues confronting learners and teachers. Student age, culture, background and motivation, theme, subject, module, learner and teacher learning platform are all important variables. This study understands the rule of variation, through comprehension; its wings are spread across various student cultures and traditions.

Furthermore, the variations need Virtual Learning Environment (VLE) and LMS tools like frontier, Blackboard and WebCT platform for running e-Learning courses, but the weakness is that the system is more focused on online administrative and less on pedagogical issues (Kolås & Staupe, 2004). The methods push teachers to use limited method of delivery. The pedagogical system exists but is more focused on limited delivery methods (Kolås & Staupe, 2004), rather than the implementation of applications to impact upon the learning procedures. E-Learning system has different kinds of methods like discussion; but there is a weakness in this method because users lack usage and communication skills between teachers and learners.

The combination of Internet and education provides the opportunity to transfer skills and knowledge to everyone at any time, but the challenge is how to balance Internet in creating a standardized e-Learning system (Patrick & Barton, 2012). Balancing e-Learning design depends on the cultural-environment in place and integration of such into the design. Many institutions of higher learning have committed huge funding in developing and implementing e-Learning system, however, previously, e-Learning aimed to represent classroom course content originally online as stated earlier, but presently blended-learning is initiated. This electronic model aim to align each other in order to boost quality e-Learning (Patrick & Barton,

2012). In an effort to boost learning, the blended-learning model presents a better effective way of delivering learning materials to learners across borders (Patrick & Barton, 2012). This study will suit blended-learning and in any other learning platform.

2.4. CONCEPTUAL MATRIX AND BRIEF CONCLUSION

In reference to the discussed literature in this study, many researchers have proposed the involvement of cultural factors in the design and development of e-Learning system for the purpose of advancing learning mandate across cultures and nations. Developers of the e-Learning system or platform have remained adamant to these calls by not incorporating learner's culture into the development. The question anyone can ask is how would this culture be captured, represented and managed? Current studies have failed to answer this question. All existing literature mainly focuses on explaining and proposing the need for grounded-e-Learning on culture, but the dilemma is that they fail to give direction on how to achieve such directive.

To understand truly if the problem articulated in chapter one really exists in the development methodologies, the purpose of this study matrix is to show and summaries the extent to which the problems in the problem statement have been diffused on SDM but absent of culture in the section A of this literature study. However, the problems and challenges faced by e-Learning systems are not subjected only on SDM. Table 2.1 below indicates five important headings associated to this study in connection with culture and all the methodologies, approaches and model discussed in the chapter. However, the mark X signposted that neither was the heading mentioned nor found in the methodologies, approaches and model discussed.

Table 2.1: Conceptual matrix of this study

	Waterfall	**ADDIE**	**Spiral-ED**	**JAD**	**Agile**	**XP**	**Scrum**	**SCROM**	**MOODLE**
Culture-oriented	X	X	X	X	X	X	X	X	X
Culture	X	X	X	X	X	X	X	X	X
Culture in e-Learning	X	X	X	X	X	X	X	X	X
Capturing of culture	X	X	X	X	X	X	X	X	X
Methodological culture	X	X	X	X	X	X	X	X	X

Furthermore, from the intensive study conducted in this section of the chapter, evidence shows that culture, its presence, how to capture it and the methodology or framework for culture-minded e-Learning are not in place among the studied methodologies, approaches and model.

This automatically proves that the problem statement in chapter one actually exists and that each of them are not cultural-oriented. But the fact remains that each of these methodologies, approaches and model can be used in e-Learning development in alliance with the "Seven cycle culture-oriented e-Learning system framework" (SCCOe-LSF). The only thing that developers have to do is to choose a particular methodology based on the nature of the system, the financial and human resources available and the expectation of the users and clients. Again, the environment where this system is used is to be considered while making decision on a particular methodology to use. A summary of each methodology, approaches and model discussed follows.

The worth and presence of the waterfall model cannot be underrated or placed in doubt in system development arena. It is a linear development process that involves phases as noted above, its shows crucial understanding of the system and clients/users expectations, as well as, the understanding and completion of one phase and the signing-out before the beginning of another phase is vital. The process can be seen as delay and time-consuming and criticised by many researchers. But for this study, it can be an added value to the methodology because all stakeholders' expectations and evaluations can be conducted at the completion of any phase in order to determine whether the expectations are met, if not, improvement and corrections can be applied. Additionally, this study could advise the use of waterfall in the development of e-Learning in alliance with e-LSDF for its ability to allow reflection before any phase can start. To achieve this, developers are allowed to use the framework at the early phase of the model and in-depth understanding of all stakeholders' expectations with regard to culture, its attributes and expectations.

Anyone can liken ADDIE to waterfall because of its linear sequential presence and its ability to work in phases. The phase begins with the analysis in which expectations are determined allowing the developers to know beforehand what the system and clients expect. Although ADDIE aims to provide institutionally structured platform for educational purpose that makes the model an ideal model on e-Learning implementation, this purpose still falls short of base of culture negligence and how it can be captured, managed and others. For the purpose of this study on e-Learning, the model can be used to execute culture-oriented programme that will address identified problems in chapter one through its ability to capture culture at the analysis phase and manage it throughout the development process till vital culture and features are diffused into the system.

Fundamentally, the model is vital to this study in the following: learner culture can be realised from the beginning of the system development, at every phase, evaluation of the actual level culture is captured and can be anticipated at the end of every phase; clients and users can have a feel on their expectations and corrections can be done in an event where expectations are not met.

Spiral approach is an iterative development process together with Spiral-ED. The process is well articulated in managing system development to extend any uncertainties and can be ironed out beforehand against the future. Based on this, risk can be identified and managed, to this study, e-Learning serves many students across different backgrounds and cultures; the geographical coverage means the presence of higher risk, but the methodology can handle such risk. Although clients and users are forever unrealistic in their expectations, to mitigate this, the approach allows the continual feedback of stakeholders in the on-going development through prototyping.

The development involves phases as noted earlier and indications from the discussion show the absence of culture and how to include it in the development, now, e-LSDF is mandated to allow the inclusion of learner culture in the development phase, starting with design phase and the approach can model culture using e-LSDF. This approach will be beneficial in the following ways it realises the exclusion of culture as a potential risk; prototypes are used to design user expectations; culture can be assessed and evaluated progressively. In addition to early summary on JAD, the JAD is used in this study as an approach that can engage external stakeholders (learners) in the development process. This ensures that quicker input and feedback are drawn and errors managed. It also ensures that users' (learners) needs are met on time, because the methodology focuses on current needs of the learners. The fact that learners are drawn from various backgrounds and cultures suggests that expectations can vary, and quicker development of JAD means changes, corrections and modifications are paramount in the process. So, e-LSDF can be used on JAD model to achieve a culture-oriented system.

In summary of the agile methods, and important to this study, the methods are used to facilitate the development of e-Learning systems that are done within budget, time and meeting users' (stakeholders) expectation through the understanding of user needs and continual engaging with the user throughout the development process. With a fundamental focus on principle-based approach and change adaption, this assists the study in overseeing the wellbeing of the stakeholders in general. Agile came into existence as a result of the failure of waterfall to meet

and manage current and future changes in the development field, with its principle and manifesto, the approach is working hard to bridge the gap and shortfalls of waterfall. For the purpose of this study, the approach realised the innovation and current changes in the learning environment and on students' expectation and this approach is able to work with e-LSDF in the cultural context to understand and align these cultures and expectations at the pinnacle of the development and continual adaptation of changes subsequently. All the challenges confronting development using structured or traditional (waterfall) methodologies are all closed with agile.

XP is a methodology in the family of agile. For the purpose of this study, technology world is rapidly changing together in e-Learning. E-Learning development should be supported with a methodology that will allow continual involvement of stakeholders in the development process, focusing on meeting the actual goals and objectives of the system and that of stakeholders through active delivering of quality systems. The actual outcome of the system heavily depends on the continual testing of the system throughout the process. The testing allows for changes and corrections at any time in the development process. To achieve this, it is postulated that e-Learning stakeholders and developers should be culture-oriented through collaboration, focus and testing.

Nonetheless, catering the needs and expectations of students from divers groups is always complex and challenging. As a lightweight methodology in the family of agile approach, Scrum is used in this study as complex problem solutions in the e-Learning fraternity, ability to deliver a learning system within time and budget and cope with competitive time and edge in the rapidly changing technological environment. To engage with the stakeholder in the development, the daily meeting of developers is well encouraged and this is done to understand the extent to which the process is going as well as giving positive feedback to the stakeholders. The incremental nature of the process means that the e-Learning development can be done continually till a desirable outcome is achieved. However, through this method, the current state of each learner's culture is well understood and future plans are implemented to better the execution of the culture-oriented system. Although the methodology suits small and large systems, it allows developers working together with common aim and objectives.

SCORM as an approach is rooted in 'components or content usability' in an environment. To achieve its purpose in this study, the high risk in managing large numbers of students from different cultures can be monitored and controlled. e-LSDF consists of platforms that favour

active and better learning goals and through SCORM each of the components on the framework is well represented and reused continually. The approach usability in this study means that learning components can be used in different ways for multipurpose and in a multicultural context. For example, a component in one language can be customised in another language. In an effort to make education material accessible to all, MOODLE was initiated as noted earlier MOODLE in regard to this study can be seen as a free learning platform to promote active learning. Its mandates are to provide learning materials and tools to learners across the world at no cost. The uniqueness of the mandate means that learners can operate and manage MOODLE on their own with no extra support from anyone. Ironically, this platform has no customable cultural identity to allow learners and other users to customise the menus to suit personal ideas. To the proposed study, the inclusion of e-LSDF at the fabric of its implementation is to allow cultural components, contents and features in the system so that users (learners) can learn the content in their own mother tongue.

E-Learning (system) design and execution rest on framework as the fundamental base for development. There are few frameworks that associate with culture and e-Learning culture available. Hofstede's is comprehensive enough in presenting different lines of culture associated to classes of people in the society and how they react. The analysis from all the five dimensions shows detailed significance of culture in the organisations, nations and individuals, but the discussion failed to disclose how these dimensions are managed as well as capturing of culture or culture integration into the design of a learning system. The inadequate way to recognise the presentation and capturing of culture means the framework fell-short of meeting learner cultural expectations. For the benefit of this study, e-LSDF will bridge the existing gap in presenting culture-oriented framework that will speak to the needs of the learners across different cultures and backgrounds.

The inclusion of a framework in the development of e-Learning systems is for a good reason in order to guide the development in the right direction and applying necessary principles and components. For this reason, this study applied framework in its development in order to come up with innovative e-Learning system that works in the interest of the users. Khan's framework dimension has shown a road map for developers to follow in the development of e-Learning system. The ethical dimension of Khan is limited to 'learners social, economic and background diversity, breaking the digital-divide by making content accessible' to learners. The framework is lacking in its inability to show how culture can be managed, captured, maintained and the

way forward. This study regards the effort of Khan's dimension but aims to strengthen it through the effort of this study.

However, the implementation of e-Learning involves theory. The understanding of the role of theory model calls for comprehensive formulation of framework that will realise the lack of the physical presence of learners in the learning process in allowing learners to be self-motivated in the learning process. By so doing, the factors that impact upon physical learning at present will be incorporated using this study. The theory aims to structure needed result in the development process. The fallout can be regarded as a crisis to this study. However, the ideas and characteristics of constructivism and behaviourism can be associated with this study for better development of e-Learning platform that confirms culture.

E-Learning is a reputable force increasing borderless learning. This platform has influence across the board and impact positively upon teaching and learning. The analyses on e-Learning above have given a detailed explanation about the usage of e-Learning in the learning process; the fact shows the absence of culture in e-Learning. Some researchers mention culture, but in accordance with this study, their statement have nothing to do with the capturing and positioning of culture in e-Learning platforms. Same analysis has shown the benefits of e-Learning system accustomed to culture. In order to address this gap in e-Learning, this study framework stands to offer a much needed solution.

The lack of culture-oriented e-education goes beyond e-Learning. Online and distance learning aims to facilitate better learning using available technological media. The fact is that online operates in a learner's environment and this indicates that directly or indirectly, culture influences how learners react in this media. In order to give learners value for their confidence, online should be culture-oriented in order to capture wider imagination.

The execution of pedagogy has remained challenging in the mix of multiple literature available online, however, pedagogy can be seen as the platform in designing e-Learning that will benefit teachers and learners, but the reality remains unseen. The initial flexibility of pedagogy is really missing, and based on the mandate in pedagogy this study framework will offer new direction for pedagogy to accomplish its mandate.

Section A of this study can proudly say that among the discussed methodologies and approaches it has drawn the need and use of methodologies in the development of the system and one common similarity and missing link is that culture of all sorts is hardly mentioned or used. This shows a height of neglect on learner's culture and its usage on system development

methodological family. The overall findings from the reviewed literature deeply indicate a gap and lack of learner's culture on e-Learning development framework, theories and methodologies. To achieve much needed learning outcome while using e-Learning platform, the inclusion of culture-minded framework can be well considered.

2.5. THEORETICAL GROUNDING

Information Systems analysis and design is based on conceptual modelling. Criticism has accumulated over IS design for lack of theoretical grounding, specifically in the area of epistemological assumptions (Recker & Niehaves, 2008). People's views on information systems (IS) are based on ontology, epistemology and the humanist nature of the problem under investigation. This section of the study shows the philosophical standard that shields knowledge (epistemology), principles to carry research (methodology) and existence (ontology) (Mingers, 2001). According to Cameron (2011), this component shows how our world is presented.

IS is mandated to represent real-world phenomena graphically in order to engage stakeholders. Conceptual models are used to capture knowledge, ideas and perceptions around our real-world. Conceptual modelling has four elements: "grammar" (example, construct set and rules that govern construction); a "method" (the process through which it can be managed), "a script" (modelling procedure of the product), and "a context" (the platform of the model). Conceptual modelling "determines the acceptability and usability" of the proposed system (Recker & Niehaves, 2008). All these help to present a meaningful world to IS stakeholders.

To be grounded in the framework of e-LSDF means to evaluate few philosophy terms like ontology, epistemology and humanist. The greatest challenge in educational research is to determine how culture as an identity and entity influences teaching and learning (Bracken, 2010) and how culture is captured and represented in e-Learning. As stated earlier, IS involves people, procedures, data, hardware and software, most especially the environment where information exists with the end-users of the system.

Any framework to be developed must be flexible enough to explore features, customs, traditions, values, attitudes, symbols that define learners' approaches to learning conditions (Bracken, 2010). A flexible framework can be instrumental in recognising and averting diverse consequential effects and curriculum peculiarities. This theory is explored further in another chapter in this study.

2.5.1. Ontological aspect of this study

Ontology is a "philosophical" approach of establishment and understanding reality (Recker & Niehaves, 2008; Raddon, 2010). According to Oates (2008), ontology is a view about our world. Conceptual models may not guarantee joint understanding; the lack of understanding can be in respect of the differences in epistemological expectations. Different researchers define ontology with similar content, like Fonseca (2007), who defines ontology as a "branch of metaphysics that concerns itself with what exists", and how it can be used to create and represent reality and its characteristics. Mavetera (2011) also defines ontology as a philosophy that emanates from metaphysics which is based on the field of science of existence. According to Cesare de (2009), ontology provides researcher(s) with common and simple language to depict the research process. And Kabilani (2007) says, ontology explains the world, the way it is, and in IS, it shows how the world is and how it should be. Ontology is a theory of existence, it focuses on how our world is framed or designed. Through the study, ontology represents the reality that exists between culture and e-Learning.

The ontological debate is based on the "nature of reality" and not how to identify reality (King & Kimble, 2004). It ensures that a researcher discovers participants' perceptions of natural implications and reality using a suitable research approach (Bracken, 2010). Accordingly, social reality can be co-structured actively by people who interact in it and making meaning of their world.

The common term in the above definition of ontology is the existence of reality. The same can be used in this study in ensuring that cultural reality is represented in the proposed e-LSDF. Again, according to de Cesare (2009), ontology places more emphasis on graphical representation than on philosophical assumptions because it is formulated to help inexperienced research study and in a large study area (like in Ph.D., MSc and Bachelor degree). However, it is also used as a procedural guideline to attain research outcomes and as a measure to understand and recognise strengths, advantages, weaknesses, limitations and potentiality in a research study (de Cesare, 2009). To this study, it also presents the reality of culture on e-Learning.

2.5.2. Epistemological aspect of this study

Epistemology deals with knowledge creation and distribution (dissemination) in a sectional inquiry (Bracken, 2010). The things to know about our world and how they can be known and the acquisition of knowledge about our world (Oates, 2008). "Epistemology is the theory of

knowledge" (Carter & Little, 2007: 1317). It deals with the theory of knowledge, showing that knowledge cannot be based on assumption but on engagement with participants (Carter & Little, 2007). It impact upon researcher and participant collaboration, and it indicates things to be known about our world and how we can realise them (Carter & Little, 2007). It shows knowledge and how it can be gained or acquired and how it can be applied in our environment. Then, to this study, it shows cultural factors, and how it can be applied in e-Learning system development. It also ensures that knowledge is spread with the right channel to the right audience, as illustrated in the diagram below. However, ontology depends on reality while epistemology lays emphasis on knowledge and the diagram depicts our world sphere around reality and knowledge and how people view our world.

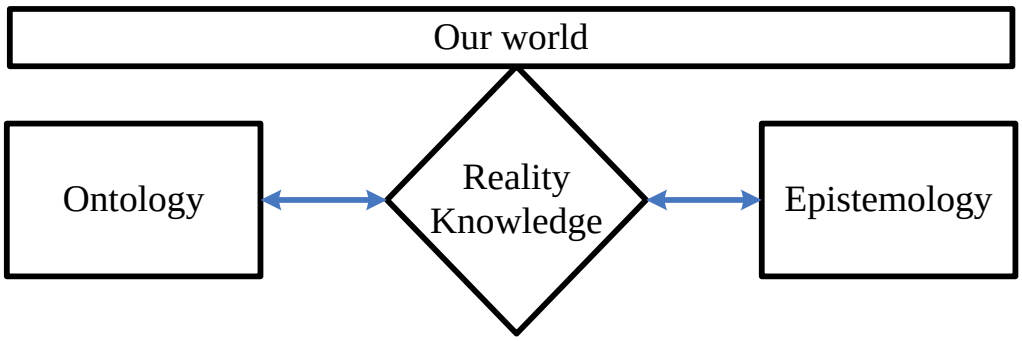


Figure 2.10: Summary of ontology and epistemology

Both are dependent on our world for accessibility and the shareable reality of knowledge.

2.5.3. Humanist aspect of this study

To this study, humanistic aspects constitute a philosophy on software development rooted in culture and people's link with their environment. According to Feinberg, Furner, Mai and Tennis (2012), the humanistic is an expert exercise. IS occurs in cultural practice, and, the experts who design, implement and, maintain it should integrate cultural focus into the development. The philosophy deliberates on actors (human beings) acting on the environment. The authors' wealth of knowledge does not command their environment because environmental issues are not deterministic and the humanistic is caused by the actions. Actors in IS help to create interactive knowledge in the environment (Mavetera, 2011).

These experiences and knowledges can be formulated through co-operation with the environment with the help of "humanistic-culturist tradition" and epistemological evidence (Mavetera 2011). E-LSDF implementation works with the users and the environment. The purpose of ontology, epistemology and the humanistic in this study ensure that generated

knowledge is represented in the proposed framework in order to showcase flexible framework that will reflect diverse cultures across e-Learning in SA. The use of humanistic philosophy can also help to show the influence of culture on e-Learning which can be captured on e-LSDF.

2.5.4. Conceptual framework for the proposed e-Learning system

A theoretical framework binds together social system and theories used in a study showing why the problem under investigation exists (Mavetera, 2011). It also presents possible solutions and remedies to the problem; same is applicable to this study. The integration of pedagogical models should be considered by designers and teachers using e-Learning systems (Geogouli, Skalkidis & Guerreiro, 2008). In reality, some e-Learning systems do not depend on the pedagogical model, but a pedagogical model shows tools for e-Learning development (Geogouli et al., 2008). But in some cases, tutors can choose their own design which suits their instructional models. However, many e-Learning tools in operation overrule the key pedagogical principles (Geogouli et al., 2008).

To guide and provide support to building on as educational framework or model that enhances e-Learning platform in support of South African diverse cultural and multinational values. There is the need for e-Learning development framework that shows and supports the structure of effective education that is innovative and interactive and built on the ethical factors and dimension. There are tools that capture our world and make sense out of it (Gregor, 2006), like the theories to be discussed. To bridge the gap between nature and organisation and development framework, the following two theories are used. The Activity Theory (AT), proposed by Vygotsky and Leont'ev as a framework for context and situation description (Cassens & Kofod-Petersen, 2006). The model seeks to understand cognition and activity in an environment and captures "knowledge and conceptual knowledge" that is integrated into intelligence systems (Cassens & Kofod-Petersen, 2006). According to Hashim and Jones (2007), AT is a theoretical model used for analysing and getting knowledge via "tools and artefacts". AT discovers contextual knowledge that can assist "qualitative and interpretative" study in understanding important cultural and historical environments which are dynamic and rapidly changing purposes, objectives, tools and process. AT sees activity as primary, with the perception "that goals, images, cognitive models, intentions, and abstract notions like "definition" and "determinant" grow out of people doing things" (Hashim & Jones, 2007: 4). Kuutti (1996) defines AT as a framework for understanding human and social practices as development procedures, which interlink sequentially. According to this study, AT is a

framework or model used to understand the cognition and activities through qualitative and interpretive research to change and innovate social processes on learning (e-Learning).

Actor-Network Theory (ANT) is also a theoretical framework of research on design and conversion of the varied network. It includes agents, people, machines, organisations and other objects and entities that constitute the human and non-human in our world (Naidoo, 2009). ANT is ontological grounding that studies the link between actors (Cordella, 2010). The increasing innovation in technology may assist to improve activity and management at large. According to Cordella (2010: 2), "ANT recognises that technology and people are not distinct pre-existing actors which influence each other through their relationships".

At this point, the inclusion of ANT in this study was motivated by Naidoo (2009) definition showing the link between people (learners), machines (e-Learning systems), the organisation (education institution) and the world where culture and learning coexist. ANT emphasis on the framework to represent cultural influences on teaching and learning, how it can be managed properly and how knowledge is disseminated via actors. This framework is motivated by the "blended learning platform" integrating classroom learning (face-to-face) patterns with web-based learning modalities (virtual classroom) and approaches (Georgouli, Skalkidis & Guerreiro, 2008). The proposed framework contains cultural factors, community factors, ANT and administrative factors (student, content factor, learning style and activity/exercise factor (AEF)). Each factor influences and is controlled by the static and dynamic culture, because some cultures are static (cannot change overtime) and others are dynamic (changing as days pass-by). According to Al-Hunaiyyan et al. (2008), a paradigm shift is needed to capture different cultures. The framework below is aimed at achieving culture-mindedness on e-Learning design and framework that attempt to capture culture as stated in the problem statement. One can see in Figure 2.11 below that the cultural factor covers other factors in the learning environment. Each of the components in the framework is discussed below the diagram, but ANT has been discussed above:

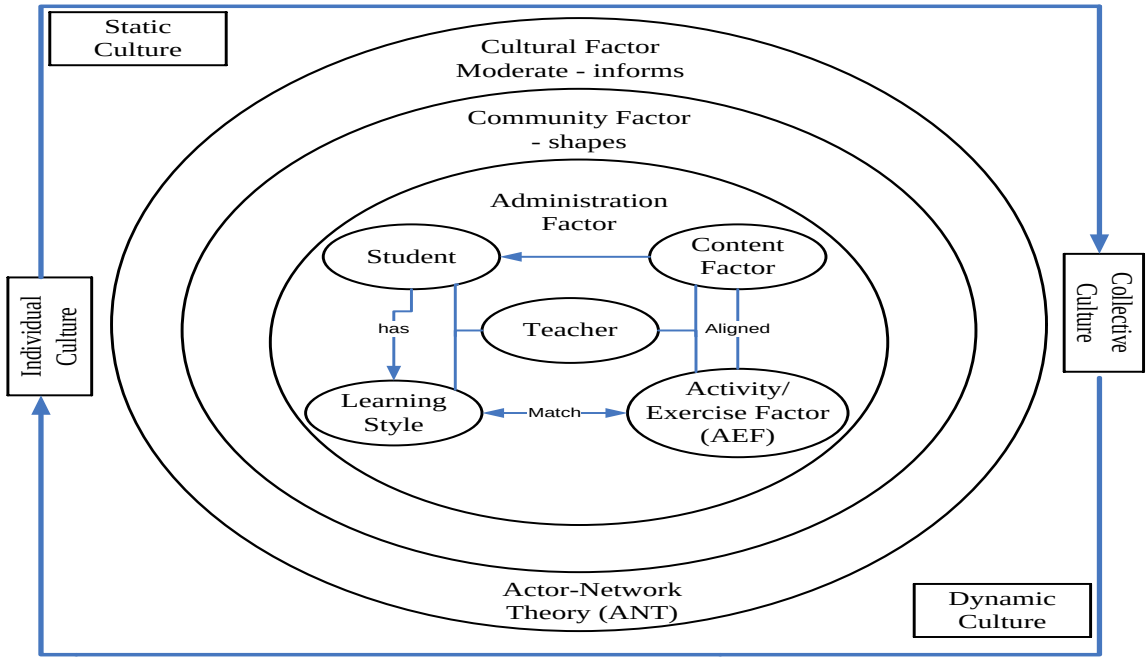


Figure 2.11: Conceptual culture-oriented e-LSD framework *(adapted from Georgouli et al. (2008) and Blanchard et al. (2005)*)

Cultural factor: according to this are the factors that affect e-Learning systems towards success or failure. According to Lephalala and Makoe (2012), e-Learning system like honour, obedience, respect and regard for authority, mutual bond and friendship are crucial in design. Based on the attribute and definition of culture as noted earlier, the attributes which impact upon learners relate to e-Learning in the learning process. So these factors focused more on all those characteristics being collective, individual, static and dynamic that heavily influence a learner knowingly and unknowingly.

Static culture focuses on peoples' actions, behaviours and many more that cannot change soon. These attributes can be realised on e-Learning ensuring that each one of the features brings positivity to the learning platform while **dynamic cultures** are rules and laws followed by learners in the learning environment. The learning environment is inversely influenced by the community factor where this study takes place. **Individual cultures** are those acquired personally while collective cultures are embedded societal values and beliefs.

Culture exists in a community. The **community factor** ensures effective communication, collaboration in dissemination and gathering of information and working with course-mates in group discussion forum, chat-rooms, news, announcements, wiki, bulletin and others (Georgouli et al., 2008). Learners use these tools to stay connected in a community forum of

learning. Interaction between teachers and learners, learners and material, and among learners, assists in improving knowledge and resolving difficulties (Sun et al., 2008). The use of modern gadgets like mobile phone, iPad and many more affirm that information sharing and service and content delivery helps in building effective learning communities. E-Learning should be developed to increase consistent interaction, quality content and updated content that improves learners' satisfaction and expectation (Sun et al., 2008).

Administrative factors are tools that enable the gathering of statistical data and course evaluation documentation but it is not part of the pedagogical model section (Georgouli et al., 2008). Administrative factors constitute an essential part in the design of a web-based learning system which is known as e-course. Again, according to Lubega and Mugarura (2008), administrators are the people who carry out all the administrative work in the learning process, like student support, for the courses offered by the tutor. The major activities performed at the level of the administration phase include formulation of e-course policy(ies) (either public or private), registration and set-up (Georgouli et al., 2008). Administrators include mentors, managers (e-Learning), network administrators, policy makers and departmental heads, who are key players in the e-Learning education (Lubega & Mugarura, 2008).

Students use and learn with e-Learning systems in sharing and advancing knowledge (Barik & Karforma, 2012). Students are the final users of e-Learning systems (Wagner, Hassanein & Head, 2008) to stay involved in the community. According to Lubega and Mugarura (2008), students are the people that enter into learning contract using e-Learning. These students are assembled from different cultural backgrounds with different learning motives.

Students use contents to engage in the learning process. However, learners' attitudes toward computer media determine success or failure of e-Learning; positive attitudes bring success while negative attitudes determine failure (Sun et al., 2008). At this level, students are registered at the university or college, either for undergraduate or post-graduate study. Students are motivated towards using e-Learning for many reasons like access to education anytime, anywhere all year around. Some may not have attended any educational institution had it not been for e-Learning (Wagner et al., 2008).

Content factor define method, location and time that are flexible on e-Learning platforms. The content factor is an identifiable quality part of e-Learning (CCSESA, 2011), good quality well-designed content should be considered when designing e-Learning material (Sun et al. 2008). Content factors are those materials that influence the learning process and satisfaction like

study guide, textbook, hand-out, journal and magazine. Quality designed material determines learner satisfaction. Contents are designed and delivered according to learner needs (FAO, 2011). Content aims to deliver effective quality materials (Wagner et al., 2008). Learning style is the preferred mode or system that suits learners to understand content in the learning environment. According to Joy and Kolb (2009), learning style explains individual learning processes.

Learning style is attributed to personal experiences, needs, demands and expectation. It is embedded in "didactic modes" like diverging (learners in the category use "concrete experience and observation"). Assimilating learners prefer reflection observation and abstract conceptualisation. Converging learners like abstract conceptualisation and active experimentation and accommodating learners prefer the use of the power of observation (Joy & Kolb, 2009). The activity/ exercise factor is the task engaged in by learners to effectively use the learning system for the mandate of e-Learning to be achieved.

The provision of all learning materials and support are teachers' responsibility (Barik & Karforma, 2012). They guide, teach, design and provide learning materials to learners electronically in the process (Wagner et al., 2008; Lubega & Mugarura, 2008). Teachers may be motivated to use e-Learning because of its ability to reach wider learners. Studies have shown that the timely response of teachers increases learners satisfaction through e-Learning. For example, learners facing difficulties in online learning need quicker response; if not, they will be discouraged (Sun et al., 2008).

Lecturers/Teachers are important people in e-Learning: the students' level of experience and knowledge all depend on the teacher or lecturer (CCSESA, 2011). Also, they are intermediate persons between administration and students, content, learning and activity. Teachers are the people that administer factors in the learning environment influenced by cultural factors (Georgouli et al., 2008). Teachers need to understand culture that impact upon learning for them to remain active in the learning process.

Activity/Exercise Factor (AEF) is an assignment platform that enables the effective management of students' academic related work or activities by the tutor (Georgouli et al., 2008). Through this platform, learners can download, upload assignments, learning materials, read and add comments, announcements and many others. However, this factor brings closer all the activities associated with learning online to learners more effectively allowing them to be frequently informed on any on-going activities. The above framework can be used as a

general e-Learning development guide at instructional model level in integrating pedagogical set-up which unites “learning and learner-centred” factors in e-LSDF and e-Learning development centres. According to Lubega and Mugarura (2008), teachers design learning materials that concur with methodology standards like SCROM; they monitor learners’ progress and provision of feedback, to the extent that without proper engagement, e-Learning will fail.

2.6. CHAPTER SUMMARY

SDM is the essential part of e-Learning development. The chapter has revealed different methodologies, approaches and model that can be used in the development of e-Learning that meets users’ needs, expectations and requirements. e-LSDF depends on flexible methodologies that centre on capture and continually engaging with learners in the development cycle. However, the effective use of any methodology lies on developers understanding of the suitability of each methodology in a given development context. At this point, the literature has shown that discussed methodologies, approaches and model have no place of culture in them likewise e-Learning platforms.

Nonetheless, the potentiality behind Internet to power learning activities, increases access to educational resources across the board. The mandate of e-Learning is achievable when right methodology and approach is chosen in alliance with e-LSDF. Pedagogy and other methodologies used in the implementation of e-Learning, by any individual, organisation or developer who wants to use or develop e-Learning systems should consider the users’ cultural setting as an influencing factor in the success or failure of e-Learning and in full the utilisation of learning contents. The next chapter deals with the theoretical framework of the study which covers Constructive Research Approach (CRA) and how it was applied in the study.

CHAPTER THREE

THE CONCEPTUAL FRAMEWORK

3.1. INTRODUCTION

The previous chapter emphasised the different types of literature dealing with system development methodologies, including the approaches and models used in system development across various software projects. This chapter presents details of how a constructive research approach (CRA) was applied in this mixed research methods study. The CRA was based on the principle that a conceptual framework synchronises all the processes that this study undertakes. This synchronisation was done through the process of reflection (see Figure 3.1). Research at the level of doctorate degree needs to be guided by detailed philosophies (Artz, 2010) and this research aimed to show different ways of developing information systems for use and application in e-Learning modalities (Artz, 2010).

The footprint of constructive research approach is visible across disciplines like medicine, engineering, business administration, information systems and educational science. The main focus of CRA in this study is to develop knowledge through participants' views and apply the empirical findings to solve the problems in software development. The software development discipline is faced with a lot of problems. Empirical data cannot be fully gathered through secondary literature review but this was alleviated through participants' views. Through the constructive research approach (CRA), detailed views are sought in order to address existing problems.

Evidently, literature like Calvo et al. (2007), CCSESA (2011), Kolås and Staupe (2004) provide views on secondary data and the worrying issues surrounding the software development process as seen in chapter two, together with the discussions of culture on e-Learning and development. The empirical nature of this study sought to find data from the participants involved in educational institutions in SA on various culturally-related issues as well as the vital role of culture in the development process of e-Learning system. This chapter consists of the following sub-headings: the practical nature of a constructive research approach (CRA), the necessity for a CRA in the study, the benefits and risks of a CRA, the paradigmatic view and ends with a conclusion.

3.2. THE PRACTICAL NATURE OF A CONSTRUCTIVE RESEARCH APPROACH (CRA)

Information systems research (ISR) concentrates on generating ideas and knowledge that can be applied in industry and organizations in solving real world problems (Piirainen & Gonzalez, 2014). This calls for a suitable research approach but the approach does not fill in the space to create theories that can be relevant to solve practical problems faced by practitioners (Rautiainen, Mättö & Sippola, 2014). This means that constructive research ensure that learner's ideas are built along the learning environment (culture-oriented system). The call above suggests that constructive research approach (CRA) is an alternative solution to the problem investigated in the study. The actual purpose of CRA is to develop an innovative model through identification of real-life and theoretical problems and offer therefore a potential solution that handles empirical and theoretical knowledge (Koivuniemi, 2008; Oyegoke, 2011). The CRA is a research process for making an innovative structure that aims at problem-oriented solutions that are challenging to the field. An artefact like information systems framework, model, and design becomes a significant contribution in this regard (Lukka, 2001).

Furthermore, Oyegoke (2011) regards CRA as "problem-solving", question-driven and solution-driven machinery that depends on other research paradigms like interpretive, epistemology, positivism and empiricism. The ultimate empirical findings from CRA formulate solutions, and recommendations that are contribution-oriented in nature. The development means making something new from the original construction. This study is based on prior knowledge of e-Learning frameworks that advance the development of a culture-oriented e-Learning system. Certainly, this study is based on the principle of framework construction. However, there are a few research reports on the CRA performance and post-implementation that show the effect of CRA in practice (Rautiainen et al., 2014).

In another words, CRA is seen as a methodological research approach alongside other approaches like decision-oriented, conceptual, action-oriented, and nomothetic approaches (Lukka, 2001). Constructive research shares some similarities with decision-oriented approaches where analytical consideration is made before any theory creation takes place. Nonetheless, any construction such as mathematical, programming algorithm, methodology, framework and others are constructed including the study itself. At this point, this study defines constructive research approach as a research approach that aims to identify the problem

(problem-orientation) and engage with the construction of a solution model (solution-oriented) to make a contribution to the field of systems development.

In addition, as a methodological approach, the approach is parallel with grounded theory, theory testing, ethnography, action research and theory illustration and, among all these theories, constructive approach is a "problem-solving" approach which derives empirical conclusions from the participants (Lukka, 2001; Oyegoke, 2011). According to Lukka (2001), the common characteristics of all these methodological approaches is that researchers usually engage with the participants, involve "small sample size" and the study gathers empirical data and analyses them. All these paradigms can be used in qualitative and quantitative as well as mixed research method (Oyegoke, 2011). One can regard this approach as a hybrid. In accordance with this study, constructive research is used to resolve the technical, practical and theoretical problems. The analytical findings are largely dependent on interpretation and on the "action-oriented" nature of the study.

3.2.1. Procedures for conducting constructive research

The focus of this conceptual map is enshrined in CRA through problem-solving processes which makes it the ideal paradigm. The constructed solution is such that one can add a practical functionality (Koivuniemi, 2008). The approach revolves around a clear understanding of the intended organisational operations and activities and the researcher acts as a 'change-agent' to implement change in practice and in the participant's organisation (Lukka, 2001). Some of the steps and processes are detailed in Figure 3.1 below.

Constructive research approach is regarded as inductive research. CRA is focused on the execution or modification of concepts or frameworks. From the genesis of the research till the formulation of framework, there is a need for the researcher to redirect and reflect on each stage as the research progresses (Mavetera, 2011). The research progress is "non-linear fashion." Figure 3.1 reflects the actual integration of the processes followed: research origination, CRA, research methodology and culture-oriented e-Learning framework.

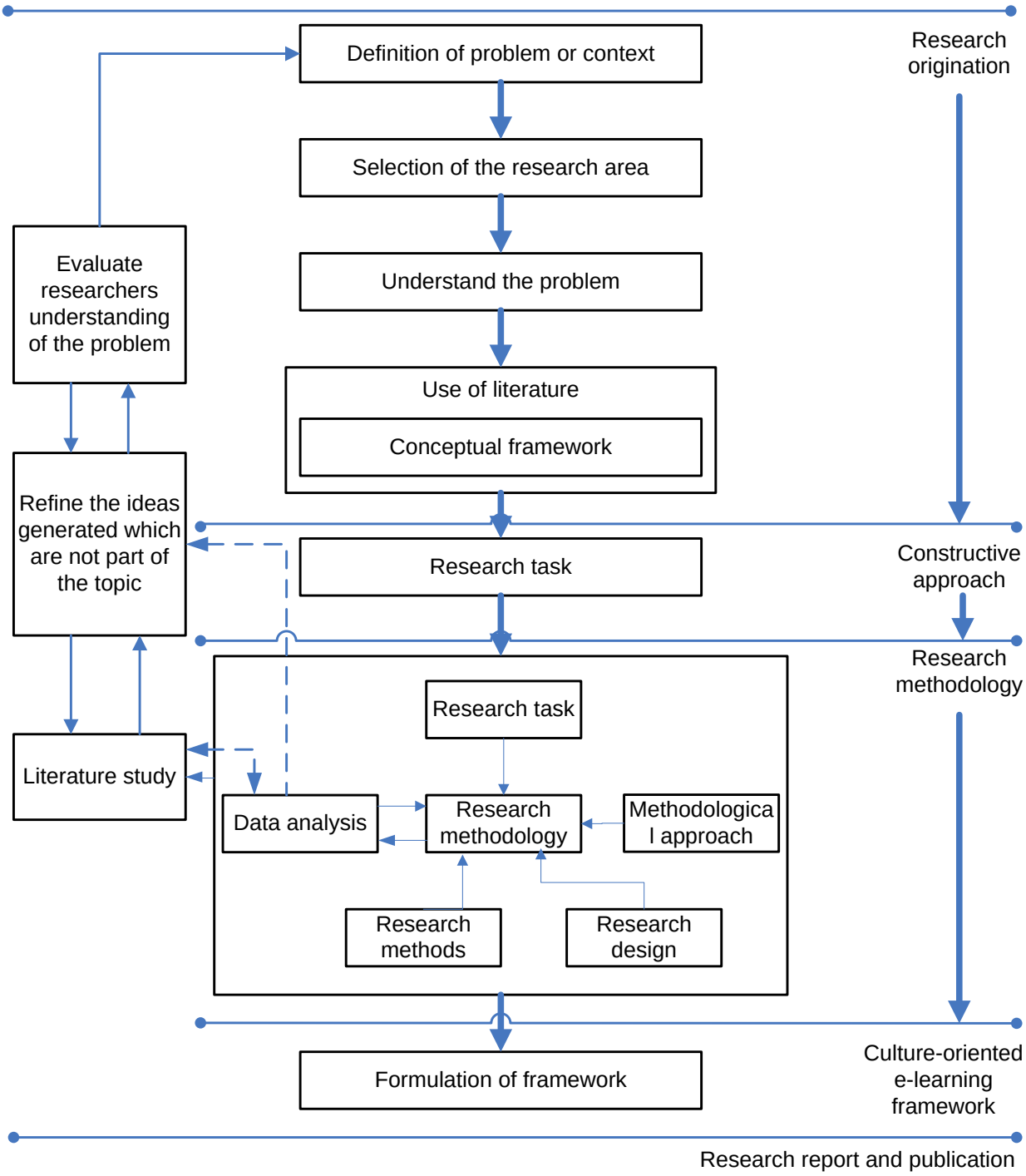


Figure 3.1: Conceptual map of the study (*adapted from Mavetera, 2011*)

Research origination

In a nutshell, the researcher began by formulating and defining the problem investigated in this study.

- ✓ **Definition of problem or context:** The research began with the identification of a practical and researchable problem as done in this study. Constructive research is a

problem-oriented methodology. The identification of the research topic is important in any research as applied here. To identify a research problem, the researcher should find a practical and theoretical topic with evident potential contributions to the field (Lukka, 2001; Oyegoke, 2011; Mavetera, 2011).

- ✓ **Selection of the research area:** The selection was based on collaboration with the target institutions (the organisations). According to Lukka (2001) and Oyegoke (2011), this balance between "supply and demand" needs to be determined in a research. This signifies that the researcher and the target organisation should bring in balanced views about the research project, including the question formulation. In this study, there is a balance in the interaction between the researcher and the audience; firstly, a pilot study was done on the questionnaire and interviews were conducted in order to determine the relevance of the research questions to the institution. In undertaking this the parties agreed on the funding, access and availability of data, and amongst other things, the researcher undertook to publish the final research findings for the participants and for the general public to read and apply in practice.
- ✓ **Understand the problem:** In this study, the topic was seen as problematic based on the brief (see Chapter 1) and deep (see Chapter 2) literature sources. Its applicability in the educational institutions was confirmed. The in-depth understanding of the problem led the researcher to read and source supporting materials through extensive literature review.
- ✓ **Use of literature:** This allowed the researcher to gain profound practical and theoretical understanding of the topic. This phase involved an understanding of existing studies on the research topic (Lukka. 2001; Oyegoke, 2011). Through the literature study, a conceptual framework was established and tested via the pilot study (see Section 2.5.4). The ultimate information was gathered through interviews, questionnaires, observations, analysis of archives.

Constructive approach (CA)

The next step involves CRA which focuses on "problem-solving", question-driven and solution-driven machinery as discussed in Section 3.3 (page 100 to 103). CRA was informed through the application of constructivism e-Learning theory (see Section 2.3.2.3).

CRA develops problem-solving tenets linked with theoretical conceptualisations. This phase of constructive research shows the innovative aspect of the research. This phase also shows the area of contribution to the field of knowledge. This study contributes to the field of knowledge

in formulating e-LSDF that assists the e-Learning developer to be culture-oriented in the development of e-Learning system that accommodates different learners' cultures.

Research methodology

Achieving the research study identified and reaching the set objectives involves systematic steps (see Chapter 4). Nonetheless, the data analysis was also defining the categories and refining the generated ideas in the study to reflect the topic under study. As one can observe in Figure 3.1 all the stages are linked and centred on research methodology because of the great role it plays.

Culture-oriented e-Learning system framework

In line with CRA stage, the researcher used the research methodology which discussed the processes used in conducting research together with its techniques (see chapter four). Along the line in the implementation of these research processes, the researcher evaluates each step and their influence on the entire of the study. At the end of the research methodology, the "culture-oriented e-Learning system development framework (e-LSDF)" in higher education institutions was formulated to assist and guide e-Learning system developers to develop an effective culture-oriented system.

3.3. THE NECESSITY FOR A CONSTRUCTIVE RESEARCH APPROACH (CRA) IN THIS STUDY

The e-LSDF is an innovative, problem-oriented, solution-oriented and contribution-oriented framework with industrial relevance (see Figure 7.1). While CRA engineers' problem-solving and practical relevance, the relevance is proved in the acceptance of this construction. The practical relevance of academic research has been an issue for academic research users and the industry (Chukwuere, 2013; Lukka, 2001; Rautiainen et al., 2014). For this reason, constructive research begins with consideration of practical and theoretical relevance and design/innovation construct (Oyegoke, 2011). Also, most of the time, industry practitioners demand to know what to get from academic research (Lukka, 2001). In the justification of CRA deployed in this study. The used CRA was motivated by the following researchers Nikula (2004), Saleh (2006) and Dave (2013) and many more who have applied it successful in their individual thesis.

Though CRA should be regarded as a "two-way communication" between the researcher and the target organisation in order to resolve a given research problem, the same communication flow is used in this study. According to Lukka (2001) and Rautiainen et al. (2014), the

researcher should be able to bring to the practitioner's prior empirical knowledge to bear upon the current study. The necessity of constructive research always encourages, engages and activates research that innovates and draws reference from prior secondary data. In order to produce relevant contributions, both the practitioner and the researcher in the study became engaged continually. The approach also ensures the validity of any research claim to the verified truth as a result of co-operation between the researcher and the practitioners in the study. The truthfulness of constructive research is tested when the developed framework is implemented and used. As a necessity, to increase the relevance of this research framework in the educational institution, the framework construction is made easy, understandable and simple to use by e-Learning developers and other stakeholders. The reality shows that constructive research outcome is hardly used by practitioners because they mainly use theories and constructions by themselves despite the academic effort in constructive research (Lukka, 2001). But the focus area of this research makes CRA an ideal approach and important to use because the outcome is applicable and implementable in the industry.

Figure 3.2 below indicates the components of CRA in alignment with the literature methodologies, e-Learning theories and the outcomes. The functions and objectives of CRA was also reflected upon to form the theoretical framework of the study. Through Figure 3.2, a reader is made aware of the starting point of the study and the final target which makes the framework suitable in the educational section. The detailed discussion of theoretical framework is provided in the Section 2.5.4.

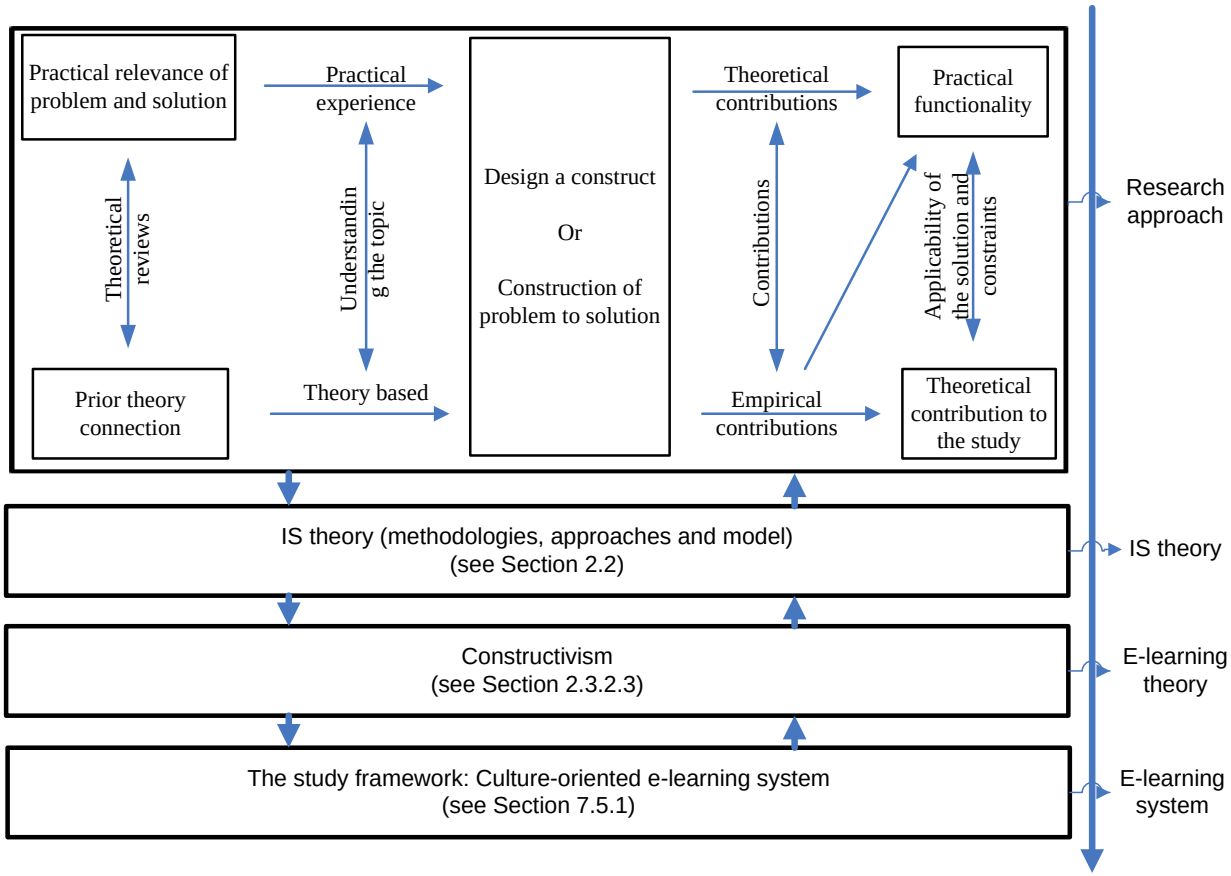


Figure 3.2: Theoretical framework of this study (adapted Oyegoke (2011), Piirainen and Gonzalez (2014))

In looking at the CRA components (Figure 3.2) as applied to this study, the component begins with the identification of a relevant problem, which drives ideas and knowledge from the secondary data source (literature study) in a bid to back up the reality of the problem. Altogether, the existing literature support the identified problems. The literature forms the fundamental base on which the research is built toward the formulation of a solution (adopted e-Learning framework). The solution aims to provide practical functionality that will be accepted and contributory in the industry. The contents of the components are adhered to in order to deliver innovative e-Learning framework that contributes to the new knowledge bank.

Overall, CRA is made up of six phases (Koivuniemi, 2008, Lukka, 2001; Rautiainen et al., 2014; Oyegoke, 2011). These phases are applied to this study together with the components (Figure 3.2). The phases show the importance of CRA to this study in general:

- ✓ Identify practical relevant problem with potential solution
- ✓ Assess the potential long-term collaboration with the target institution(s)

- ✓ Gain understanding of the research topic
- ✓ Present clear possible solution;
- ✓ Innovation (developing ideal solution);
- ✓ Demonstrating clear theoretical link and contribution to the research field;
- ✓ Establish the volume of the solution's applicability.

All the above mentioned six phases of the CRA also played a central role in this study addressing real-life problems in providing a real-life solution, constructing innovative e-Learning framework to solve the lack of culture in educational e-Learning development. It based the research findings on the outcomes of data derived from participants from the selected institutions, linking prior e-Learning development knowledge with the data findings (empirical finding). Also, at this point, the study can regard constructive research as an experimental model that develops construction to be tested in the industry, the approach is based on profound data analysis from the participants.

3.4. THE BENEFITS AND RISKS OF A CONSTRUCTIVE RESEARCH APPROACH (CRA)

Constructive research is strong on problem-based approaches for contribution in the industry. The approach also works to improve the existing system, knowledge, performance and practices (Rautiainen et al., 2014; Oyegoke, 2011). The approach adapts pragmatism, the philosophy focused on research applications in practicality in dealing with problems and contributing to change. The philosophy also proves that theory analysis, validation and applicability are naturalistic and rationalistic paradigms for the purposes of double testing (Oyegoke, 2011). This section of the chapter deals with the benefits and risks of CRA in a research.

3.4.1. The benefits

The approach offers new research opportunities to the researcher compared to other traditional approaches. Among the benefits is the cooperation that exists between the researcher and the industry, and the ability to add new ideas and normative innovation application in the industry and in the academic world (Oyegoke, 2011).

The target industry views constructive research as an avenue to understand practical problems that have been researched and the possible solutions (Lukka, 2001). To this study, the benefit of constructive research is to close the gap between research and practice and promoting

knowledge. The paradigm makes meaning of prior knowledge and applies it to construction and the industry. Through CRA, the researcher and the participants work together in the questionnaire and interview questions to understand the needs and expectations of the e-Learning developers and learners.

3.4.2. The risks

Constructive research has several risks, and the the risk is always a threat to constructive research. The risk is linked to the relevance of the research findings, that aspect of the research which tries to publish the outcomes.This risk is managed by making an unambiguous contract for publication between the researcher and the practitioners (Lukka, 2001). Constructive research can take a long time to complete, and maintaining target industry in this long research duration can be hard. Sometimes, the problem size may be smaller than initially anticipated and this constitutes a risk to CRA.

The involved industries are worried about losing their confidential information to the researcher and this can be regarded as the reason why industries are refusing to form a joint alliance with the researcher but rather hire the service of a consultant (Lukka, 2001). The main focus of constructive research is the problem-solving orientation, and bringing a potential solution and making a contribution. Failure to meet this target can be a risk to the CRA approach. In managing these risks in the study, the researcher applied these mechanisms; at first, a conceptual research paper was published to create awareness of the research problem in the discipline. Secondly, a pilot study was conducted on the MMR questions to eliminate errors and unnecessary questions and improving the quality of the questionnaire (see Section 4.6.3. Procedure). Again participants were engaged in continuous follow-up during the data gathering process in order to minimise the completion time.

3.5. THE PARADIGM VIEW

The critical components of each of the definitions and the approach to investigate the study include a philological belief in linking the actual method and the procedure used. An approach is a plan to carry out research in regard to the relationship between paradigm, design and methods (Creswell, 2014). Figure 3.3 presents a framework that the researcher used to link the research paradigm, design, method and approach as an indication of how this study was executed.

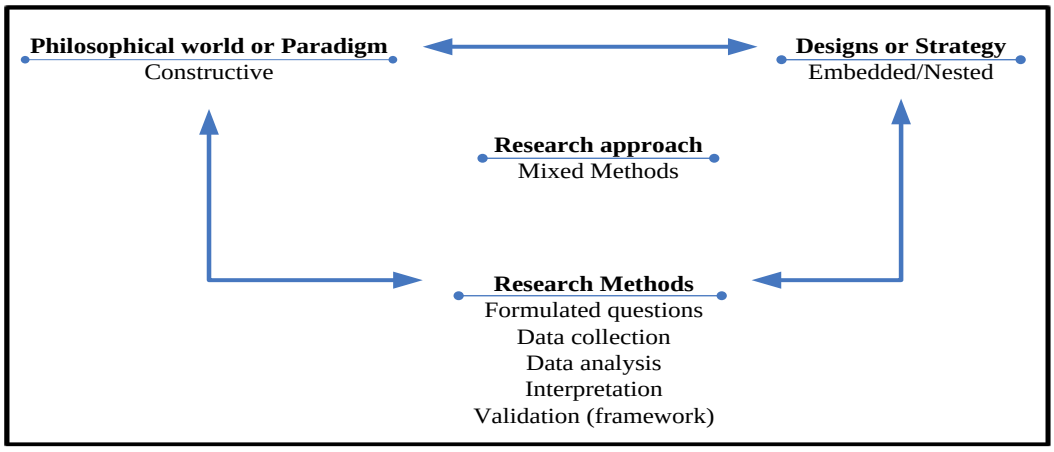


Figure 3.3: Research framework (RF) (*adapted from Creswell, 2014*)

3.5.1. The research designs applied

The selection of a research approach is necessary in carrying out a research study. The design of the research really matters as well after a philosophical worldview or paradigm (see Figure 3.3). A research design or strategy is a kind of inquiry found in qualitative, quantitative and mixed research methods (Creswell, 2014). The rationale behind any research design is to provide a special pathway to handle the data collection, analysis, interpretation and validity in a research. There are different kinds of research designs used in mixed research method which is convergent, sequential explanatory, exploratory, embedded/nested, and transformative and multiphase mixed methods (Creswell, 2014; Terrell, 2012; Creswell, 2008). Each of these research design types, helps to ground the pathway in carrying out research, the same purpose is applied to this study. Figure 3.4 below illustrates how embedded or concurrent nested strategy was used and applied in chapters five and six in the study at large.

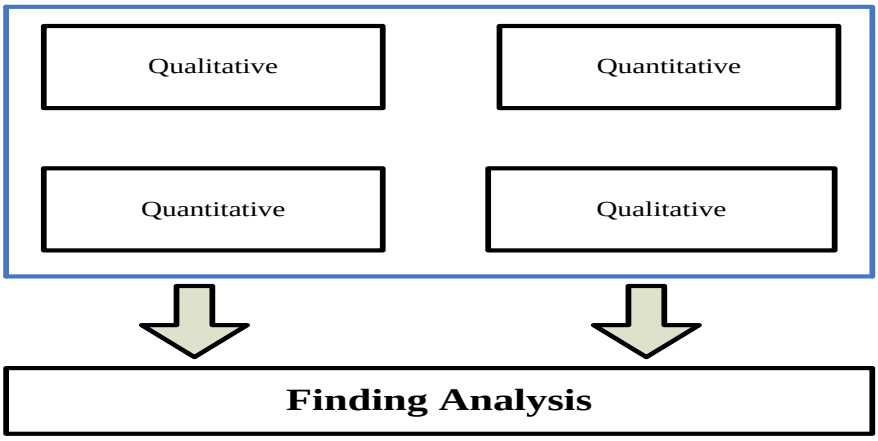


Figure 3.4: Embedded/Nested design (*adapted from Terrell (2012) and Creswell (2006)*)

To this study, embedded/nested mixed method is used in carrying out qualitative and quantitative data from e-Learning developers, customizers and learners respectively. The purpose of the design is also to help the study to gather or collect, analyse and interpret the study findings ensuring validation. Besides, Embedded/nested mixed method is research design that embeds qualitative or quantitative or both data in a research with one side of the data playing dominating or supporting role in the study (Creswell, 2014). The embedded data can be achieved through "one-phase or two-phase approach" (Creswell, 2006). This means, data can be collected and analysed sequentially or separately. Besides, one research question can be used in both qualitative and quantitative approaches or different research questions can be applied in the study. Nonetheless, the research objectives remain the same and the quality or the priority among the methods may not really matter in the study. However, one method plays a superior role over the other; for example, qualitative data plays a supplemental role over the quantitative method in the study. Unlike other designs like triangulation, embedded method is not intended to use two separate data to answer a single question and the mixed data result can be reported separately (Creswell, 2014).

Also, to this study, the researcher used what is called 'double two-fold data result' to achieve embedded design result which means that the separate data results collected from both methods are integrated into one final report in the study and for validity purposes. Conversely, the embedded or nested design was made possible through this sequential research method process as presented in the research framework.

Furthermore, the mixing or linking of methods cannot be accomplished outside quality control technique and design choice. Design choice can be concurrent or sequential strategies (Terrell, 2012; Creswell, 2002). The different kinds of mixed method designs are also used to showcase the way and time interval the data collection took place. Mixed methods research doesn't show that separation between qualitative and quantitative approaches

However, this study used embedded or concurrent nested strategy for the following reasons:

- ✓ Qualitative data is supplemental over quantitative data.
- ✓ Quantitative data is embedded in qualitative data analysis.
- ✓ Priority was given to the primary research question with less prominence on embedded analysis.
- ✓ Conceptual theoretical framework adapted from Georgouli et al. (2008) and Blanchard et al. (2005) (see Figure 1.4) and Hofstede's cultural dimension guided the researcher.

- ✓ Gained better understanding of culture-oriented e-Learning system from participants' perspective (qualitative and quantitative).
- ✓ Used to handle, understand and integrate research questions from different research methods among the phenomenon.
- ✓ The method can be advantageous in simultaneous data gathering and seeking double ideas from both methods.
- ✓ Disadvantageous: integration and transformation problem which may cause variance.

The main mixed methods design application in this study is developed in Chapter five to seven. The design is made possible with mixed data analysis. As noted in Chapter three, a mixed method uses qualitative and quantitative research method in conducting, analysing and interpreting results. According to Creswell (2008) and Williams (2007), the method integrates qualitative and quantitative methods in conducting, and analysing findings into one single research study.

3.6. CHAPTER SUMMARY

The main purpose of this chapter win order to design and produce conceptual and theoretical frameworks rooted in research. A paradigm was used in this study with the general idea to execute an e-Learning applicable framework. The research adopted mixed design. The chapter began with an in-depth evaluation of CRA, leading to an understanding of the design of the conceptual and theoretical framework adopted. In addition the necessity of CRA, its benefits and risks were also determined. In the next chapter, system research methodology and design, and all the processes and techniques used in this study are articulated.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1. INTRODUCTION

The previous chapter dealt with the theoretical framework for the research with emphasis on CRA. This chapter deals with the research methodology and design used in this study including all other component parts that complement the research process. The chapter also aligns the objectives of the study, research questions, data collection methods and data analysis. Research methodology is the process used in conducting research together with its techniques. The research process is guided by a paradigm. The paradigm enables a deeper understanding of the study.

Researchers normally use quantitative, qualitative and mixed methods in research. This study deployed mixed methods due to the nature of the research and its relation to e-Learning. Mixed data was gathered from developers and students; nonetheless, the outcome was based on empirical theory-building of a framework on culture-minded e-Learning systems. The chapter is organised into the following important sections: the research chapter map, research paradigm, methodological approach, research design, research methods, data analysis, limitations of the research methodology and conclusion. The chapter starts with the research chapter map.

4.2. THE RESEARCH CHAPTER MAP

A map can be seen as the representation of relationships using a graphic diagram (Novak & Cañas, 2008). The graphic representation puts together two or more constructions with a line purposely to link the construction. The idea of the map is to understand and showcase a concept and structure (Novak & Cañas, 2008). Brinkmann (2003) regards a map as “knowledge map” that uses structures to illustrate how concepts and ideas are interlinked in the topic. A map is a building block for structural representation of concepts. In this study, a map is a structured graphic director that links one area of knowledge to another comprehensively. This study used the chapter map in Figure 4.1 to present the structure of this chapter from one stage of the chapter to another, meaning, it is a guiding principle for the entire chapter. As a structure, the detailed components of the diagram are discussed beginning with 4.3.

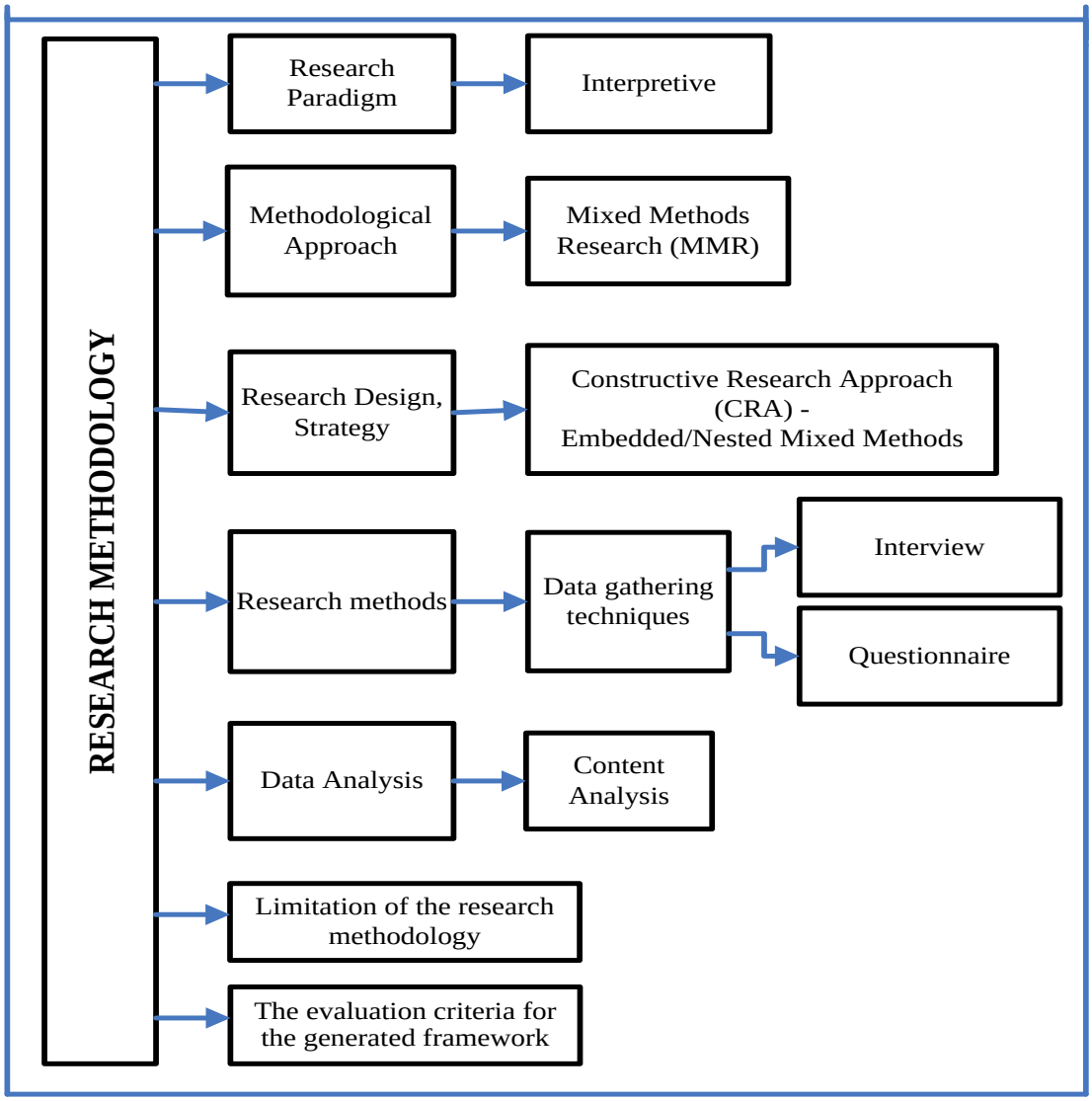


Figure 4.1: The chapter map

4.3. RESEARCH PARADIGM

A paradigm is a universal term in research whose philosophical standard embraces epistemology, methodology and ontology (Mingers, 2001). It is used to organise research philosophies that facilitate the research process. According to Cameron (2011), a paradigm is an approach that shows how our world is presented. Research philosophy can be seen as an evolution of the "research background", research idea and knowledge and its setting (Saunders, Lewis & Thornhill, 2007). A paradigm can also be regarded as the system of beliefs and perspectives that indicate how this study was carried out from idea to action.

There are a few research paradigms or schools of thought that can be used by a researcher in any research study. The paradigm can be positivist or functionalist (deductive) or interpretive

(inductive) research, constructive research approach (CRA). Also, there are different instruments which suit positivist, interpretive and constructive research like questionnaire, interview, observation, idiographic descriptions (Henning et al., 2004; Mingers, 2001). The choice between these paradigms lies in the nature of the problem under investigation. From the nature of this study, an interpretive paradigm was used because of its footage in qualitative research methods as well as suitability for mixed research methods. The research design is based on the constructive research approach (CRA).

4.3.1. Interpretive paradigm

This section presents interpretive research as used in this study. The evolution of the interpretive research began in the early 19th century, with disciplines like psychology, sociology, anthropology, linguistics, and semiotics (Bhattacherjee, 2012). The interpretive research followed a positivist paradigm but the positivist dogma was later rejected by many (Henning et al., 2004). In the 1970's the increase in interpretive research began to ensure 'validity and reliability'. Still, a few positivist researchers saw the interpretive as non-rigorous, biased and time-consuming in the manner it was carried out. According to Sarantakos (1998), the interpretive is a social interpretation of processes where 'social reality is framed through the interpretation of the actors', while social activities are based on interactions and a social reality theory which depends on social interpretation. For this study, the interpretive paradigm presents the social reality of the study which is based on the idea of participants on e-Learning, and the constructive e-LSDF is based on the analysed data.

According to Bhattacherjee (2012), interpretive research is commonly used with qualitative methods. Interpretive (inductive) research suggests that the world is not socially objective (unbiased) or singular, but it is based on individual (human) experiences and 'social settings (ontology)'. It is subjective in explaining a social phenomenon, in the attempt to make meaning of the world's social realities. From the ontological viewpoint, the objectivity of reality is rejected by the interpretive paradigm (Henning et al., 2004). Again, the inductive allows for more insight into the understanding of respondents holistically (David & Sutton, 2004). Furthermore, researchers believe that our social context cannot be separated from social reality, because social reality is interpreted through common sense or "sense-making" methods, not through hypothesis-testing as seen in the positivist paradigm (Bhattacherjee, 2012). This means that the data interpretation was done based on the data gathered by the researcher. Still, the selection between interpretive and positive research paradigms depends on the nature of the

problem under investigation. Both work on mixed methods, but this study is focused solely on interpretivism.

According to Oates (2008), the positivist seeks to understand the world around us based on how people think, feel and act while the interpretive researcher seeks to understand the "social context" and natural setting in IS on how people construct the world of reality and the influence of people (Onwuegbuzie & Leech, 2010). In this study, positivist perspectives are used for understanding how students think, feel and react in e-Learning while interpretive research aims to determine e-Learning from a social setting and from the developer's standpoint. It also focuses on how the participants view their e-Learning environment, their values and meanings attached to their views. According to Oates (2008), the interpretive shows how participants' perceptions change over time from one person to another. It can then be said that interpretivism is rooted in information systems and their implementation (Hyötyläinen, 2013). A positivism paradigm is the oldest and mainly useful when studying the social realities to know people feel about their world around and their actions (Oates, 2008).

As stated earlier, interpretive or inductive research methods help to build research theory using ethnography, action research and constructive research while positivist or deductive methods test theory using survey and laboratory tests. Working with positivist paradigm, researchers use empirical data in testing theories while the interpretive researcher builds theory through observable and interview data. This means interview data is usually collected using interpretive instruments but questionnaires were used to gather data in this study.

The knowledge about our world and its events can be constructed through understanding and description of the beliefs, culture, attitude, reasoning, and values of the inhabitants and not just through observation (Henning et al., 2004). In this study, the e-Learning platform can be regarded as the learning world. Interpretivism ensures that this world is well understood and any acquired knowledge in the world is practically disseminated to the right people while the positivist allows for respondent understanding and reactions of their e-Learning world and they use it to advance learning. To achieve this, interview texts are interpreted to understand how e-Learning systems operates in the way developers make meaning around it. From the mandate of interpretive research, the researcher interprets the interview findings from the view of the respondents while the positivist paradigm interprets data involving questionnaires.

To this point, interpretive paradigm ensures that a researcher gains conceptual views about the reality of our world in being more subjective than objective. The researcher exists in reality

more in the social context. In this study, interpretive research is a mechanism that seeks to understand the social context from the respondent's view while the positivist understands how people's actions and feelings shape their social reality.

4.4. METHODOLOGICAL APPROACH

This study is carried out using mixed methods research. The methodological approach is the "science of methods" that organises research principles that are associated with a particular paradigm (Mavetera, 2011). This approach involves research design and methods, data gathering methods and data analysis and the justification of these. A methodological approach can be seen as a standard guideline for research practice. The methodological components and their roles are discussed below. This study deployed mixed methods as explained in 4.4.1 below.

4.4.1. Research approach used in this study

Every research method is based on philosophical assumptions. Research methodology determines the use of methods and techniques in a research. Nhlapo (2012) describes methods and techniques as the actual tools used to carry out research. These tools are carried out through mixed methods. According to research sources, there are three commonly used research methods: quantitative, qualitative research and a combination of both (mixed method) (Crittenden, 2006; Richard & Morse, 2007). Quantitative research shares its philosophical roots in positivist theory which focuses on 'scientific research reality' and statistical data is used (Crittenden, 2006). Qualitative research is non-experimental research and rooted in interpretive paradigms (Crittenden, 2006), using non-numeric data processes (Oates, 2008) and exploratory research (Sarantakos, 1998; David & Sutton, 2004). Mixed methods can be seen as the use of different methods at the same time; it can also be used when one method is not sufficient for the study (Richard & Morse, 2007). Table 4.1 outlines the strengths and weakness of mixed methods research (MMR).

4.4.1.1. Mixed Methods Research (MMR)

As a philosophical assumption, mixed methods can be defined as the way research data are gathered and analysed using quantitative and qualitative methods in one study for greater understanding of the research problem (Driscoll, Appiah-Yeboah, Salib & Rupert, 2007; Ivankova, Creswell & Stick, 2006; Wurtz, 2009; Cameron, 2011). Moreover, this study gathered data using interview and questionnaire as research instruments as a demonstration of MMR. Ivankova et al. (2006) as well as Wurtz (2009) agree that mixed method is used when

a single method is inadequate. Both take advantage of each other and the analysis is always robust (Graff, 2014). Though mixed method analysis involves the integration of the results from both methods, the integration is complex and challenging (Cameron, 2011).

Furthermore, there are lots of definitions for an MMR from researchers exploring the meaning. According to Brannen (2005) and Cohen et al. (2007), MMR means using more than one kind of research method; it also involves the use of mixed-strategy or "multi-strategy" to gather quality and reliable data. Angell and Townsend (2011) refer to it as strand-methods, as the combination of rudiments of qualitative and quantitative research methods for the reason of collaboration in a research (Ostlund, Kidd, Wengstrom & Rowa-Dewar, 2011; Fischler, n.d; Onwuegbuzie & Combs, 2011). For the benefit of this study, an MMR is aimed to optimise the strengths of both methods. In accordance with this study, an MMR is seen as a combination of more than one method in a single research because of the inadequacy of using one method.

The mixed methods also give room for the use of terminology from both methods. To some researchers, qualitative research lays emphasis on inductivity and interpretive ideology (David & Sutton, 2004); quantitative research is deductive in hypotheses testing (Angell & Townsend, 2011; Brannen, 2005) and mixed method lies between inductive and deductive (inductive-deductive) (Brannen, 2005). Still, as stated in the problem statement, and the research objectives, this study aimed to design culture-oriented e-Learning systems framework, but achieving the objectives demands a research method that allows gathering data from both developers and users. Hence, this study focuses on mixed research method because of its attributes that favour gathering deeper information among different participants in order to achieve its strengths (see Table 4.1). The objective of this study has necessitated the choice on MMR and the insufficiency of both quantitative and qualitative methods in attending and collecting adequate information needed in this study to answer the research questions and address the research problem.

This study involves two groups of participants with differing knowledge on e-Learning. To gain their balanced views, there is the need to deploy a method that draws information from both groups, and MMR was chosen to meet these expectations. The implication is that mixed method is paramount in this study in order to gain more understanding of the phenomenon at hand, through the use of different kinds of data gathering instruments. Also, MMR extracts information from staff and students from the chosen institutions on the cultural issues attached to e-Learning system design and usage. Notably, in gaining the opportunities of MMR, two

kinds of questions were designed, qualitative questions (interview) for e-Learning developers (staff) and quantitative questions (questionnaires) for the students (the users) in order to fill in the missing link in using one method.

Table 4.1: Strengths and weaknesses of MMR (*adapted from Johnson & Onwuegbuzie, 2004*)

	Strengths	Weakness
1	Pictures, words and narration are used to add more meaningful information and answers.	Always difficult to be carried out by a single researcher mainly when both methods are used concurrently.
2	The strength of mixed research method is provided.	The researcher is entitled to understand both methods.
3	It can allow a wider answer to different research questions.	Time-consuming
4	The strength of the method can subdue the weakness of the other.	Expensive
5	It allows for firmer evidence for a summary via combination of findings	Difficult to analyse
6	Missing insight from a single method can be added, because the researcher is not restricted to a single method.	Difficult to choose appropriate research approaches, methods, and others.
7	It allows for the use of different data gathering instrument.	The corroboration of the findings allows complex interpretation

4.5. RESEARCH DESIGN

A research design is the structured layout of how research is conducted; the aim is to gather meaningful information to answer identified research questions and achieve research objectives (Kothari, 1985). As an important part of this research, the research design outlines the steps followed in this study to gather and measure data. The structure begins with data sampling, as a structure, according to Rajasekar, Philominathan and Chinnathambi (2013: 22), "plan your work and work your plan". Every research study needs a planned structure as a research roadmap. For the purpose of this study, research design structures out systematic ways through which a study identifies all participants, data gathered, presented including analysis of the data and the reporting.

4.5.1. The design or strategy used in this study: Constructive Research Approach (CRA)

Research strategies (design) are a philosophical assumption process aimed at data gathering, analysis, data reporting; the process goes in cycles throughout the research (Creswell, 2009).

There are different kinds of design or strategies (design) like phenomenology, discourse analysis, grounded theory, action research, ethnography, case studies, design and creation, constructive research approach (CRA), explanatory sequential, embedded/nested method and many more (Creswell, 2014; Otero & Harlow, 2009; Oates, 2008; Creswell, 2009). Many other kinds of methods have been proposed by researchers (Tesch, 1990; Creswell, 2009; Wolcott, 2001). Each of these strategies is used to draw out or showcase the nature of the final outlook of the research. For the purpose of this study, the chosen strategy is the embedded/nested method that interacts with constructive research paradigm (see Chapter three for the detailed explanation). Besides, the researcher used this design to provide a special pathway to handle the data collection, analysis, interpretation and validity in the research. The process shows how to construct the nature of the final outcome of this research, in allowing the researcher to formulate a framework that will enable developers in the development of a culture-oriented e-Learning system.

Furthermore, the choice of one strategy or another depends on the nature of the problem under investigation. In theory-building, the design, like grounded theory, and constructive research can be suitable (Bhattacherjee, 2012; Oates, 2008). This study is more on theory-building (development of framework) than hypothesis testing. Nonetheless, chi-square hypothesis testing was done in some of the qualitative research questions in order to identify views from students that effect the design of the e-Learning framework, the hypothetical questions and the rationale behind them are found in section 6.5 (Chi-square analysis).

The constructive research approach (CRA) is a research process to yield or create advanced construction. According to Creswell (2014), constructive research mostly combines with the interpretive paradigm. The paradigm thought came from Mannheim; it aimed at result and individual eagerness to understand their world and its environment (Creswell, 2014). The method formulates research questions through "phenomenon driven or theory driven or the combination of the two" (Oyegoke, 2011: 576). The reason is to discover or resolve real-world problems as recognised in the problem statement of this study. As part of the objective, this study creates a framework that serves as a catalyst for e-Learning development. The usage of constructive research can be traced back as popularly used in the field of "psychology, education, and nursing" (Mills, Bonner & Francis, 2006) and the same is used in the IS discipline. Caplinskas and Vasilecas (2004) explain paradigm as a research process for constructing advanced ideas; the construction is used to resolve challenges and problems faced in a discipline. Constructive research paradigm is an applied and implementation process to

adapt knowledge and bring changes in IS discipline (Hyötyläinen, 2013). To implement and bring change in the context is not just watching the changes happen, but rather as part of the change and actively reflecting on the experiences.

As a methodology in this study, constructive research starts with a defined problem identification from literature sources as witnessed in the problem statement in order to add to the existing body of knowledge and able to be applied in the development (Oyegoke, 2011). The method is "research-aided model"; it aims at the active practical creation of a development model and methodology for a new knowledge, concept and solution for a given institution (Hyötyläinen, 2013), and the focused institution can implement the model to create solutions. The model sets knowledge background for the research study to generate a model for solution to concepts in any organisation. This implies in this study, that education institutions will derive concepts from this study and the ideas generated through this constructive research will assist in future model/framework implementation. Additionally, constructive research is used in this study to showcase the platform in the execution of culture-oriented programmes in the design of e-Learning that will reflect learner culture across the board.

On this note, the approach contributes actively in the formulation of theories, model, algorithm, frameworks or methodologies in any specific discipline. The constructed knowledge through constructive research can be applied on culture-oriented e-Learning platform that will contribute to the field of development of e-Learning framework and platform for future development.

This method is among important strategies in the IS research and discipline. The strategy gains insight into IS research design and is regarded as a construction block and process in grounded theory, ethnographic theory-building and illustration, action research, conceptual modelling, qualitative research, interpretative research and others (Caplinskas & Vasilecas, 2004). The true nature of constructive research assists in interpretive research in recording interviewee voice during interview sections for an in-depth and richer theory construction (Mills et al., 2006). The method has its footprint in the IS field, interpretative research and inductive-deductive research. The footprint makes the method ideal in this study, for it has modelled a framework that e-Learning developers and designers will use to advance e-Learning development across cultures. However, the method goes with criticism and challenges, because it lacks 'scientist's ability to maintain a neutral attitude' during the design and implementation period in the construction of their advanced ideas (Caplinskas & Vasilecas, 2004, p. 4).

Constructive research is a method used for the design of a framework for future use with the help of the interpretivism data process.

4.6. RESEARCH METHODS

4.6.1. Data gathering technique

This section of the study deals with the actual instruments used to gather data. The collection of data is an important aspect of data gathering (Sarantakos, 1998). There are different means of data gathering including the following: questionnaire, interview, document analysis and observation (Oates, 2008). Systematically, in this study, an empirical study was done to derive the primary data which could be used more for theory generation than theory testing. Empirical evidence gathered was largely based on primary data through an interview and questionnaire and secondary data gathered through a literature study.

Although this study uses MMR, its findings were based on data collected through interview and questionnaire. In line with Zohrabi (2013), Angell and Townsend (2011), this study deployed questionnaires (closed-ended) and interview (structured) which are usually used in MMR. The empirical nature of this study demands a data gathering method to gather quality information from institutions that use e-Learning system as learning tools and NWU students that uses e-Learning in their academic related works. The two instruments chosen in order to elicit better and robust information from the individuals involved in this study are interview and questionnaires, nonetheless, both of them have drawbacks like any other data gathering instrument.

4.6.2. Data gathering techniques used in this study

4.6.2.1. Interview

This section of the chapter deals with an interview and how it was used in the study. By definition, an interview is a kind of data gathering instrument that establishes conservation between people or group of people (interviewer/researcher and interviewee/respondent). The central purpose of an interview is to gain a deeper understanding of the problem under investigation and elicit information from participants (Oates, 2008; Richard & Morse, 2007). However, an interview is regarded as a fair and quicker way to conduct any investigation (Kothari, 1985). Again, an interview process is a pre-planned event, meaning that the agenda for discussion is set before the interview begins; it can be conducted face-to-face, telephonically or via computer. Most of the time, face-to-face is used (David & Sutton, 2004). The agenda for discussion is centred on the phenomenon under investigation; this signifies that

questions are not randomly selected, but framed in the interest of the interviewee (Oates, 2008). Also, an interview involves asking interviewee questions verbally and it is a commonly used technique in the social research context and listening is a key to its success (Sarantakos, 1998; David & Sutton, 2004).

The choice of any data gathering instrument is highly dependent on the research context and the researcher. The choice of an interview and together with a questionnaire in this study is as a result of the nature of the research approach deployed in this study, and the wealth of personnel and students' knowledge in the chosen institutions. The personnel interviewed have quality skills and ideas on how e-Learning system is developed and implemented in any education organisation. This study uses standardised, personal, written, oral, open, and guided interview and closed-ended questionnaire to elicit quality information from the sample.

For this study, an interview is a formally established conversation between two or more people and is planned with the aim of gathering information from interviewee(s) in a study. It can be done on a one-to-one or in a group, in whichever way; the aim is the same no matter the method used.

Again, this study used interview and questionnaire in collecting data used in framing the e-LSDF because it suits the research approach. Sarantakos's definition of interview supports the use of interview in this study. Its good characteristics, qualities and features are distinct from other instruments. The section below provides a discussion of the kind of interview used in this study. The study used open-ended interview, and the researchers played a central role in facilitating the interview process in reading the questions to the interviewee as well as recording the responses and in the distribution of the questionnaires.

Structured Interview

The purpose of this section is to illustrate the structuring of the interview questions. Structured means, to organise, pre-set, standardised, and pre-determined questions for all interviewees in the interview process (Oates, 2008). Based on this definition, the interview questions used in this study were prepared and organised before the interview. This kind of interview is a rigorous and well-guided process often better than the use of questionnaire. The questions asked are read by the interviewer as pre-set and the questions are asked without alteration but as arranged (Sarantakos, 1998), and responses are written down by the interviewer.

Nonetheless, this kind of interview is controlled through the interviewer's intervention in limiting the interviewee from speaking out freely (Henning et al., 2004). Welman et al. (2006), believe that the interviewee is restricted to the order of arrangement of the questions. Deploying this kind of interview in this research means that the interviewee is only allowed to think within this study context, and allowing for deeper reflection before the answer to any question. But many researchers still criticise this form of interview for its process being incomplete, because the interviewee's views and ideas are side-lined (Henning et al., 2004).

According to the study, organised research can lead to an organised outcome. A structured interview is a logical or formal interview with questions administered by the interviewer in the data gathering process. The organised process means that the questions are prepared before the interview starts, and the interviewer and interviewee are guided on how the questions are asked and responded to.

Interview preparation and process

According to this study, the opening step in the interview process was to send the research interview questions to the interviewee for their permission to participate in the research. Interested individuals indicated with an appointment for an interview. The interview arrangement was made through email and telephone calls, after which a follow-up was made using the same channel for sending the request; available participants indicated their interest by setting up an appointment with the researcher.

The interview session began with the interviewer introducing himself coupled with the research objectives. Then, the interviewer asked the questions as they were structured accordingly and the interviewee was given enough time to elaborate and answer the questions in accordance with the structure and objectives. For example, section A of the questions must be fully answered before the interviewer moves over to section B of the questions. Closing remarks were given to participant at the end of each interview session (see Annexure A). The discussion continues on the second data gathering instrument used.

4.6.2.2. Questionnaire

The questionnaire is widely used to collect quantifiable data (Oates, 2008). It can also be seen as prewritten order of questions to provide information on a phenomenon (Kothari, 1985; Chukwuere, 2013). It is also a pre-set question that respondents have to answer, the respondent reads and replies as needed (Kothari, 1985; Degu & Yigzaw, 2006). Nonetheless, there are two

main types of questionnaires; open and closed-ended and a combination of both (Kothari, 1985; David & Sutton, 2004).

Open-ended questions allow respondents to express their views freely without being subjected to the questions as stated and the questions do not contain boxes, rather a blank space is provided for the respondent to write answers while closed-ended questions are restrictive and prewritten, meaning that respondents can only select answers as provided on the questionnaire (David & Sutton, 2004; Kothari, 1985; Degu & Yigzaw, 2006). A combination of both involves closed-ended and open-ended, and the questions begin with closed-ended and end with open-ended (Kothari, 1985). For the purpose of this study, closed-ended questions were used, the questions were arranged in the form of multiple choice and participants were allowed to select their answers from the options provided, in order to get quantifiable data to support data gathered from the interview.

4.6.3. Procedure

This section of the study dealt with the main processes followed in handling and analysing the questionnaires used in this study in order to guarantee that the best quality outcome emerges specifically from the quantitative data. The section also covers the changes and recording applied in the questions. The procedure involves data management, recoding of the questions and quantitative analysis process.

Data Management

For data consistency, this subdivision of the (chapter) study covers how quantitative data were managed for quality and consistency. The process began with the pilot study; later the quantitative data were allotted particular designation numbers for tracking against any possible data error. To be able to detect and eliminate data error, double data entry technique was deployed. The deployment of double data entry includes entering data separately on the spread-sheet (Microsoft Excel) while the Statistical Analysis System (SAS version 9.3) was used to verify the existence of any form of errors by equating the data entered on the Spreadsheet. Non-matching data were marked, and corrections were made immediately by verifying the data on the questionnaire with the allocated designation numbers as seen on variable creation (see Annexure C).

Recoding of the questions

Quality outcome or result is a key to this study. To ensure that, the research questionnaire was rearranged in such always that participants can easily complete the questions without difficulty. As a closed-ended questionnaire, it aimed to produce quality results with the research objectives at a centre point; some questions were merged to reduce the scale. The merged questions were rearranged between single and multiple, single option represents more desirable responses with the highest value on the scale. For instance, single option characterized by the selection of an option not more than once while multiple takes into account all the multiple question options selected by participants (more than one selection). The following are the research question structures: personal particulars (Biographic questions); What are the challenges facing the current e-Learning system? How can cultural-orientation be implemented in e-Learning to assist learners better? They all have varying numbers of questions on each of them in this study, for this reason, recoding of the selection option is necessary through factor analysis process.

According to Walker et al. (2010), factor analysis was used to "composite measures" for the table shown in Annexure C. Annexure C involves the main research questions, question (individual questions), original scale (responses and scales) and final scale (used responses and scales), and the final scale is the main scales used in data analysis. The purpose of the recoding of the question variable construct alteration is to show the actual structure of the question answer or options used which was restructured from the question's initial answers or options (see Annexure C).

Quantitative analysis process

The study deployed a number of quantitative tools for analysis and producing the findings which include descriptive frequency distributions, correlation and chi-square. Descriptive statistical frequency distribution analysis was done and presented in all the quantitative questions while randomly selected questions were correlated and chi-squared as shown in chapter six. This deployment aimed to ensure internal and external validity, objectivity and reliability of the study. Williams (2007) says, there are different kinds of methods used to carry out quantitative research. Among the methods are descriptive and inferential research methods. Descriptive research method relates to description and explanation of the relationship and distribution between variables. While inferential research method deals with determining the

degree of confidence and dependence on the sample selected before generalisation to either population (Chambliss & Schutt, 2012).

This study deployed descriptive research method for variable explanation and understanding of their rationale. A descriptive method involves survey research, correlational, observational studies and development design (Williams, 2007). Furthermore, correlational research method was used in this study to determine the difference among two variables and their impact upon on this study. Just as Williams (2007) puts it, validity and reliability of a research vitally affect correlational coefficient, because the examination of the relationship between the variables proves the validity and reliability of a research study which is applied to this study. Besides, the analysis also involves the cross-sectional study which is used in line with correlational research method to compare relationship among two variables in this study in accordance with the frequency distributions. Frequency distribution offers univariate distributions (Chambliss & Schutt, 2012). The frequency distribution is shown numerical included; percentages and their variable values relationship (see Section 6.3). Indeed, in this study, quantitative analysis followed the principle of embedded/nested mixed methods (see 4.5.1. the research designs applied).

4.6.4. Research population used in this study

For this study, the research design involved data sampling (selected population), data collection/gathering (interview/questionnaire as the primary data source while literature studies from other researchers form the secondary data source), and analysis (content analysis through the Statistical Analysis System (SAS version 9.3), Atlas.ti, handwritten (manual) coding method and Statistical Package for the Social Science (SPSS)). This research followed the research design listed in 3.7.1.

4.6.4.1. Data Sampling

Sampling is the act of selecting a proportional sample to partake in a study in order to provide meaningful information to solve the research problem at hand. The process involves strategy, and strategy is an important aspect of a research; good strategy assists to frame unbiased and robust research outcomes (Wilmot, 2005). The most difficult issue in any research population is a sampling selection. Researching any phenomenon can be costly and complex especially if data is collected from the entire target population in a discipline or city (Oppong, 2013). The decision on sampling strategy and the sample size is very complex and difficult on mixed research methods as a result of the number of participants to participate in the study

(Onwuegbuzie & Collins, 2007). It is not possible to collect information from the entire sample in this study because not everyone was involved. Hence, sample selection is fundamental. Moreover, sampling is the core exercise in mixed research but has not been well defined in textbooks and journals (Robinson, 2014). Still, the main objective of mixed research in this study is to discover ideas from a range of participants. This situation compelled the researcher to select a limited proportion of the sample (Oppong, 2013). Sampling concerns form the heart of this study for the selection of participants for the interview and questionnaire; sampling influences the aim and objective of the study.

The choice of a particular sample is an important decision in this study because of the practical and ethical issues in the research. Sampling is to pull out a small sample from the whole population after which the findings are generalised to the entire population. Sampling is also the most important aspect of any research method (quantitative, qualitative and mixed) (Onwuegbuzie & Leech, 2007). To support the need for sampling in this study, Kothari (1985), defined sampling as a partial selection of the population used to represent the entire study population. Through this study, data sampling, the ideas and data collected from the limited sample can be generalised to the entire population if their expertise and wealth of knowledge is statistically acceptable.

Population sampling impacts upon the quality of the research findings (Coyne, 1997). Through this sampling, the researcher was able to decide on the research questions in order to achieve the objectives of the study. To a great extent, sampling was challenging: the inability to select an appropriate sample size, the right respondents, and the right site for this study (Oppong, 2013). The quantitative population of 74,355 students in 2015 academic year across NWU was used and a qualitative sample population of five (5) developers across selected institutions. Overall, this study regards sampling as the collection of research data from a small number of participants to represent the whole population. According to Kothari (1985), sampling involves three important decisions which are the sample, the sample size and sampling discussed after sample size determination.

Sample size determination

This calculation shows how the sample size in this study determined the quantitative method. Following Krejcie and Morgan (1970), the study adopts the sampling formula:

$$n = \frac{p(1-p)N.\mathcal{X}^2\alpha(1)}{d^2(N-1) + p(1-p)N.\mathcal{X}^2\alpha(1)}$$

where p = Population proportion = 0.50 (for maximization)
N = Total population
d = Error margin (Degree of accuracy) = 5% = 0.05
and $\chi^2_\alpha(1) = \chi^2_{0.05}(1) = 3.841$ and p =5%=0.05.

Using the Total Population, N= 74,355, the estimated total minimum sample size is given by:

$$n = \frac{0.5(1-0.5)(74355)(3.841)}{0.05^2(74355-1) + 0.5(1-0.5)(3.841)} = \frac{71399.389}{186.84525} = 382$$

The Sample: Decisions had to be made on who to interview and select. This involved the kind of information to gather and who is able to supply the needed information for this study. The process involved the determination of the "sample universe", the targeted population or 'study-population', the entire respondents that would answer the interview questions (Robinson, 2014). The sample selection criteria tested why everyone was not selected. On the "why" criterion, the characteristics that distinguish an individual or selected group must be stated and their contribution to the study clarified. The criteria must also state the reason why individuals or group of individuals were excluded from the study (Robinson, 2014). Actually, researchers have explained that the choice of participants was based on the wealth of their knowledge with regard to the e-Learning system.

The sample provides practical borderline and theoretical assistance in the data analysis and interpretation procedures (Robinson, 2014). If a research study is general and more focused on specific individuals, then, the sample needs to be identified. They are the explicit universe or sample, the more transparent and valid it can be; if not, the study is not credible (Robinson, 2014).

The choice a particular sampling method depends on the study, researchers' knowledge, rigour and acceptance in the discipline. Random sampling is commonly used (Marshall, 1996). The sample is drawn from the universe sample (NWU, Wits and UCT e-Learning developers) for

the qualitative data while quantitative data were collected via questionnaire from NWU students. The inclusion of developers and students in this study as the sample is justified in the sampling section as discussed below.

The sample size: is concerned with the number of people to be interviewed and questioned in this study as a result of the use of mixed research methods, and, according to Kothari (1985), the bigger the sample size, the better the result and the lower the sampling error (Marshall, 1996). The sample size ensures that sample errors are eliminated (Oppong, 2013; Nastasi, 2014; Marshall, 1996; Robinson, 2014). Any study without provisional sample size, resource allocation, study duration and others cannot be ascertained. To ascertain the sample size quantitatively, approximate maximum and minimum sample size number can be estimated, but there is no appropriate way to ascertain sample size. This study used a sample size of 382 students across three campuses of NWU and five (5) developers (Krejcie & Morgan, 1970).

In mixed research methods, conducting qualitative research always goes with this question; what will constitute a right sample size? or how can the researcher determine the sample size? (Baker & Edward, 2012). This question and others are really a challenge to qualitative researchers. According to Marshall, Cardon, Poddar and Fontenot (2013), qualitative researchers never provide vindication on the sample size selected (Mason, 2010). This relates to a lack of sample size standard procedure and determination. In attempt to ascertain qualitative research sample size, a researcher can apply these three methods; point one, reference input and recommendations by other researchers (methodologists), secondarily, the researcher should apply same sample size cited in the similar study and lastly, the researcher can apply for statistical numbers in line with saturation within the research (Marshall et al. 2013). For instance, Creswell (2007) recommends qualitative sample size limited to four (4) or five (5) participants. According to Tuckett (2004), there is no single defined and recommended sample size; rather a sample size should be based on purposeful rather than random sampling. This study determined the qualitative sample size through a recommendation from other researchers in using sample size between four to five participants as suggested by Creswell (2006).

The sampling: To select the sample size (the respondents), the researcher selects samples based on random sampling from the whole population (probability sample). However, probability sample can be used in mixed research (Angell & Townsend, 2011) and the researcher selects samples based on the influence or the ability to get the people to be involved

in the study (non-probability sample). However, there is a need for justification on the chosen respondents in this study. This study also uses convenience and judgement or purposive sampling. Both non-probability and purposive sampling can be used in mixed methods (Angell & Townsend, 2011; Graff, 2014).

A convenience sample, when using this sampling, population samples are selected based on the participants' availability and accessibility which can be disadvantageous because it can gather poor data as a result of the familiarity that exists between the interviewer and interviewee and the credibility can be low (Kothari, 1985; Nastasi, 2014). Still, this sampling strategy is suitable for money, effect and time saving. The technique can be rigorous, subject to participants' accessibility, but the outcome could result in poor quality and credibility (Marshall, 1996, Oppong, 2013). Nonetheless, the sample is also used because only reachable participants are selected and considered (Oppong, 2013).

The sampling used in MMR focuses on participants' proximity and eagerness to participate in the study (Robinson, 2014). To prove the use of convenience sampling is to show the limitations on the geographical and outlining the demographic border on the sample universe and avoiding conceptualising claim (Robinson, 2014). The sample was deployed in this study because of the expertise of the participants and the ability of the researcher to get or reach out to the institutions and students involved in this study.

A judgement or purposeful sampling, when using this sampling method, the researcher uses his/her discretion to select suitable people to supply quality and reliable information and in quota sample a group of people are selected and interviewed from different classes (Kothari, 1985; Anderson, 2010; Oppong, 2013). In this study, participants were selected based on their experience, knowledge, expertise on the study under investigation (Anderson, 2010; Oppong, 2013; Guest, Bunce & Johnson, 2006; Wilmot, 2005). Nastasi (2014) believed that purposive sampling as a random sample (probability) in nature, ensures credibility in accommodating a larger sample, but is also used in small sampling.

Again, the select participants were "productive" in answering the research questions, having research objectives in accordance with the research subject matter at hand (Marshall, 1996; Guest et al., 2006; Coyne, 1997). The selected participants were the staff at the e-Learning department and registered students. The main goal is to gain insight and meanings into particular study terms (Luborsky & Rubinstein, 1995).

4.6.4.2. Justification of the research sampling

As noted earlier, this study was carried out using MMR. The qualitatively selected sampling is based on the participants' experiences and expertise as earlier noted especially their expertise in using and working with e-Learning systems in the area of development, analysis and maintenance of e-Learning systems. The quantitatively selected sampling was focused on the students' knowledge in the use of e-Learning platforms in their daily learning processes. However, the sampling also depends upon participants' interest, ideas and knowledge of the on-going problems challenging software development at large and much more in e-Learning system development. The quantitative data respondents were selected from all three campuses of NWU as said earlier based on probability (random) while qualitative data were selected on non-probability sampling (convenience and judgement or purposive sampling).

However, the initial quantitative sample size was determined at 382 students from NWU; the collected questionnaires exceeded the actual figure (382) with 728 respondents. While five (5) qualitative data (interviews) were conducted. The high quantitative data response rate is, as a result of the questionnaire being circulated online (using Survey Monkey) and printed hardcopies with the availability and convenient of participants to participate. In summary, this study conducted five (5) in-depth interviews with e-Learning analysts and developers across selected institutions and 728 questionnaires were collected among students through online media and hardcopy insulting to quality data.

4.6.5. The alignment of research objectives and research questions

Table 4.2 presents the four main research objectives of this study linked to the research questions. Each of the objectives is linked to a specific question(s) from the interview and questionnaire or both specifying clearly how the research objectives were addressed. Each of the research questions was formulated to achieve each research objective listed in this study.

Table 4.2: The Research Objectives aligned with the Research Questions

	Research Objectives	Research Questions	Instrument used
1	To understand cultural factors that impact upon the design of e-Learning system.	How do cultural differences impact upon e-Learning design and implementation in SA?	Interview
		What are the challenges faced in the development of e-Learning systems?	Interview
		What are the challenges facing the current e-Learning system?	Questionnaire

		How can culture-oriented e-Learning system be implemented to assist learners better?	Questionnaire
2	To determine how culture is captured and represented in the implementation of e-Learning in the South African learning space.	How do cultural captured in the development of e-Learning system?	Interview
		How can a culture-oriented e-Learning system be implemented to assist learners better?	Questionnaire
3	To investigate SDM that captures culture in e-Learning development, e-Learning challenges, and	How is culture captured in the development of e-Learning?	Interview
4	To develop e-LSDF that is suitable in different cultural e-Learning environments in SA and elsewhere.	What are the factors that should be considered when designing the e-Learning System (e-LS)?	Interview
		What are the challenges faced in the development of e-Learning systems?	Interview
		What are the challenges facing the current e-Learning system?	Questionnaire
		How can cultural-oriented e-Learning system be implemented to assist learners better?	Questionnaire

4.7. DATA ANALYSIS

This study adopts descriptive statistics in the data presentation and analysis, the researcher used it to summarise participants' response patterns using tables, charts and percentages. There are different strategies used to analyse data gathered in order to understand the dataset. Among the common strategies is to count the number of code occurrence, which identifies the frequent use of certain codes (Driscoll et al., 2007). Still, qualitative analysis software like NVivo, SAS 9.3 or Atlas.ti can be used in the data analysis. Another way of quantizing qualitative data is through frequently used themes, the percentage of themes selected by individuals (Driscoll et al., 2007).

The analyses in this study entail detailed attention to the recording and data coding using Atlas.ti statistical software package in content analysis while the questionnaires were analysed using Microsoft spreadsheet and SAS 9.3 software. The next section discusses the content analysis as the platform for the data analysis used in this study.

4.7.1. Content Analysis

Strategically, content analysis is used in qualitative and quantitative research. It is a methodical coding for huge textual exploration during the data analysis process; it identifies the words used, their occurrences, their links, differences, arrangements and others (Vaismoradi et al., 2013; Driscoll et al., 2007; Stemler, 2001; Neuendorf, 2002). The researcher used this analysis to determine and explain the attributes of the interview contents in order to sort out 'who says what, to whom, the purpose and the effect' in this study. Stemler (2001) sees the analysis as a process of minimising or compressing voluminous data into fewer themes and categories. The process enables the researcher to limit volumes of words into fewer words. According to Hsieh and Shannon (2005), it is a way of analysing texts. For the purpose of this study, the researcher used the process in analysing and categorising families of words according to their occurrence and use in themes.

This study is interpretive in nature as earlier noted, and the analysis and interpretation involve the extraction of meaningful information from the raw data. According to Thomas (2006), the analysis involves reading and understanding the text and associating different meanings to the original text. The researcher used the technique to identify text gap in the meaning and to create text units categorised together to form a corporate meaning in this study and questionnaire were analysed based on percentages. The technique also allows for new ideas and improvement, as new ideas or interpretation emerge in the analysis, the researcher modifies the existing text to accommodate the new knowledge and ideas (Burnard et al., 2008).

Actually, the analytical procedure consists of examining transcripts, recognising subjects within the gathered data (Burnard et al., 2008, Vaismoradi et al., 2013). However, the selection between these analyses is usually difficult for researchers as a result of common attributes (Vaismoradi et al., 2013). To this study, the content analysis assisted in the coding of the interview text contents in order to mine out the actual meaning attached to the wording in the interview.

The data coding analysis followed the process in this study (Thomas, 2006):

- ✓ **Prepare raw data folder (data cleaning file):** The raw data is formatted ('font size, paragraph, margins, highlight the questions or interviewer comments'). The process places the text in a shape to be readable and understandable.

- ✓ **Text close reading ("close reading of text"):** The raw text is read in detail for the understanding of the content and meaning. This process gives a better understanding of the interview contents for the researchers to gain deeper insight into the conducted data.
- ✓ **Group into categories:** The researcher prepares categories into different levels. The top-level aims at the research objectives and the researcher's aim and goals while the lower-level is derived from numerous raw data reading and understanding, and can be regarded as "vivo coding". In the coding, categories are used from the original meaning into text sections. Many sections were used, for example, the use of word processor (MS word). The texts are highlighted while statistical analysis software was used to quicken the coding process better and effectively on huge raw data contents.
- ✓ **Overlapping coding and un-coded text (coinciding the text):** Qualitative coding goes with rules, which are: one section of text can be coded into different or one group, and while a significant quantity of the text (example 50% or extra) may not be aligned with any group because some of the text may not be important to the researcher's goal.
- ✓ **On-going revision and refinement of the group system:** At each group, subtopics are used, points and new knowledge emerge.

This study used utilised computer-assisted qualitative data analysis software (CAQDAS) packages while Atlas.ti software was used to analyse the interview data. The software was used because of the researcher's familiarity with using it. To confirm the presence of cultural reality on e-Learning system of the chosen institutions, verbatim coding and transcribing were done in the study.

4.8. LIMITATION OF THE RESEARCH METHODOLOGY

There are different kinds of methodologies used in a research study, but this study focused solely on all methodological components found on Figure 4.1 and discussed in this chapter. Most importantly, any issues or ideas left out are important as those discussed but not to this study. There are copious limitations to the chapter, apart from time and adequate funding. Still, the following limitations have been recognised:

- ✓ The limited sample was taken from developers and students within the selected institutions and excluded the views of other higher institutions in SA.
- ✓ The population was limited to those within the selected institutions.
- ✓ The questionnaire used did not allow in-depth analysis and value of the study.

4.9. THE EVALUATION CRITERIA FOR THE GENERATED FRAMEWORK

Different industries, institution of learning and organisations are using evaluation criteria (Mavetera, 2011; Introna, 1992). These evaluation criteria are used on academic and educational thesis. This thesis or study called these criteria 'thesis evaluation criteria (TEC)' (Figure 4.2), however, these evaluation criteria are not exhaustive in a single thesis. For the purpose of this thesis, the following ten (10) evaluation criteria will be used (Mavetera, 2011):

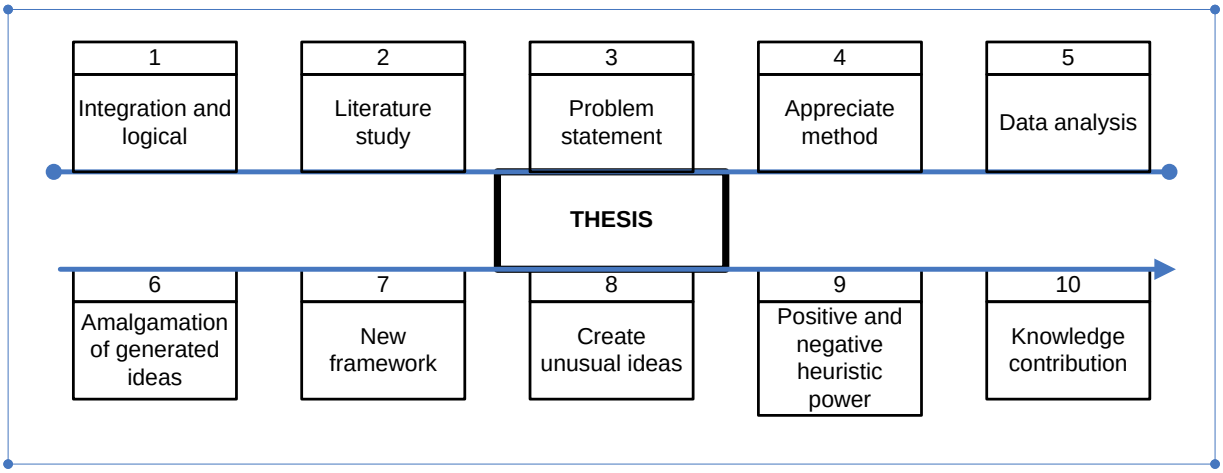


Figure 4.2: Thesis evaluation criteria (TEC)

1. **Thesis integration and logic (Mavetera, 2011; Introna, 1992; Klein & Myers, 1999):** A research study should be coherent and allowing for a connection between the topic, problem statement, literature study, conceptual idea and framework. It also allows the connection among the research methodology and the generated framework. For these connections to executed, the thesis should be arranged into chapters with headings and subheadings. Also the writing and interpretation of the findings style should comply with academic writing patterns.
2. **There should be enough existing literature study:** Any research study must be founded on relevant and existing literature study. This means that a researcher needs to have quality knowledge on the existing literature with original content and ideas on the study under researched. The literature ideas and contents should bring current knowledge on conceptual, theoretical and methodological aspects that reflect on the thesis. According to Mavetera (2011), a researcher cannot be punished for not gathering or reading all the literature that focused on the research area. The punishment is also applied on the thesis itself. At this level, the study should be able to discuss various academic sources and critic

their views as well. The gaps in the literature should also be identified as well as error in the interpretation. Purposefully, the existing literature helps to support the ideas of the study under investigation.

3. **Research problem statement:** The design of the problem statement is always influenced by the kind "research approach" to use (Mavetera, 2011). A research problem can be formulated after studying various research articles and literature in order to identify gap(s) in the field. Then, the statement of the problem may follow any of these three classifications (Mavetera, 2011; Gasson, 2003):
   - ✓ Advising a new idea, theory, framework (theoretical and methodological) in the area of the topic (discipline)
   - ✓ Implementing a novel ideas (theory, framework) that can be used in the field, or
   - ✓ The "problem statement" can be converted to research questions or suggestions.
4. **Appreciate method of inquiry followed:** This section is where the theoretical and methodological supports are discussed. This guides is seen as a lens that control the entire research problem. The methodological aspect is guided by standard, steps, processes and principle that connect the problem, chosen methods with the data gathering techniques. The researcher should be able to document all the steps and processes followed and their justifications. The steps allows the study to follow or apply appreciate methods and also for the reader to understand the research methods applied. At the end, there should be a justifications on why other methods were not used.
5. **Data analysis:** The data analysis methods should be appreciate for the chosen research method. Also, the processes in the data analysis should be documented (Mavetera, 2011). The process assist in the extraction of the meaningful information from the collected data (see Section 4.7).
6. The generated ideas, theory, framework, methodology, suggestions and other knowledges should amalgamate current knowledge and unrelated issues and problem in the field (Mavetera, 2011; Introna, 1992).
7. **The framework should create new viewpoints on the existing problem:** The finding should provide a way of understanding and viewing the existing problem under research.
8. **The framework should create unusual ideas:** The expected new ideas should be extremist or revolutionary challenging current problem in the research field (Mavetera, 2011). This calls for a researcher to be creative and innovative at his/her best.
9. **The framework must display "positive and negative heuristic power" (Mavetera, 2011; Introna, 1992):** The power of heuristic ensure that generated framework or idea

can assist a user's in coming up with a new research problem as well as providing solutions to the existing problem.

10. **The knowledge contribution in the academic field:** Primarily, academic research is regarded as contributing at the level of "publishability" (Mavetera, 2011). Any published academic journal passes through blind-reading process by experts in the field to ascertain its contribution level. The process is criteria to critic, compare and contrast and check whether the generated framework is adding knowledge different from the existing ones. Importantly, this framework in the study can advance the better development of e-Learning and culture-oriented e-Learning system in particular.

In Chapter 7, these evaluation criteria will be used and explore further. As discussed above, these evaluation criteria have been applied by the following researchers Mavetera (2011), Introna (1992), Klein and Myers (1999) and Gasson (2003). The purpose is to check and judge the contribution of this thesis findings and generated framework to the field of information systems and education discipline.

4.10. CHAPTER SUMMARY

The chapter has presented a comprehensive roadmap of how data was gathered for this study. Research methodology is seen as a road map that guides the collection of data, data analysis and presentation of the findings. Research methods, research strategy, paradigm, and data gathering methods, all were chosen in accordance with the needs of this study. The active involvement of respondents is well acknowledged in an effort to garner quality information.

The chapter has presented the qualities and attributes of the participants who generated quality data. This data is collected, analysed, presented and reported in the tradition of MMR research. The next chapter presents in full the qualitative research findings, analysis, discussion and interpretation of the main results of this research using descriptions and themes in order to answer the research questions and linking them to the research objectives.

CHAPTER FIVE

QUALITATIVE ANALYSIS AND DISCUSSION OF FINDINGS

5.1. INTRODUCTION

The previous chapter highlighted the research design and methodology for the study and its important implications. This chapter is the first stage of MMR: it discusses and presents data analysis and the results of the findings of the data extracted from qualitative (interviews) method on culture-oriented e-Learning System Development Framework (e-LSDF) in higher education institutions. The chapter fulfilled the research methods mandate as seen in Table 4.1 by analysing the study data findings and making sense of the data through interpretation, analysis and discussion.

For data analysis, presentation, discussion and findings, the chapter begins with coding issues including subheadings. The interview data presentation, analysis and discussion of the qualitative findings focus on the detailed interpretation of the themes and descriptions as coded from the interview data. The interpreted data is linked to the existing literature as presented in Chapters two and four of the study with the idea to validate the data findings. The qualitative data was coded and analysed using Atlas.ti statistical software. The following segment provides coding issues and the processes connected to interpreting this data.

5.2. CODING ISSUES (CI)

Since the study deployed structured interviews, the interview questions were structured beginning with the demographic information, after which the main interview questions followed (see Annexure A). Before the final interview, a pilot study was conducted for a refinement of the questions to achieve data consistency and eliminate data error. Subsequently, the interviews were conducted on the selected participants (NWU, Wits and UCT) due to their wider knowledge of the design, development and customisation of e-Learning system in general.

Each of the interview data was recorded, transcribed and important phrases were identified and these were later used to inform the final themes and categories in the study. In order to reach this study's objectives, the objectives of the interview were steered by the literature study and the overall research objectives as discussed in Chapter one and Chapter four. The following were the qualitative research questions:

- ✓ What are the factors that should be considered when designing an e-Learning System (e-LS)?
- ✓ How do cultural differences impact upon e-Learning design and implementation in SA?
- ✓ How is culture captured in the development of e-Learning system?
- ✓ What are the challenges faced in the development of e-Learning systems?

5.2.1. Thematic analysis

The data analysis initiated the steps in converting the qualitative data. The process started after interview data were converted from audio to written text. It aimed to ensure that meaningful information is drawn from the collected data. Generally, analysing qualitative data can be complex and long compared to quantitative data (Ellsberg & Heise, 2005). The analysis processes began after data gathering as indicated on Figure 5.1. Figure 5.1 illustrates the actual procedures used in gathering qualitative data in this study before presentation and analysis began. This research process constitutes the qualitative analysis phase and the constructive research approach was used to facilitate obtaining data from the participants through a questionnaire.

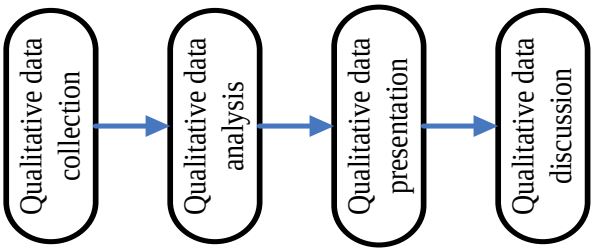


Figure 5.1: Qualitative data procedure (*adapted from Ellsberg and Heise, 2005*)

The qualitative data analysis consists of six steps as supported by Creswell (2014), Ellsberg and Heise (2005). Figure 5.2 below outlines the commonly used qualitative data analysis process as applied in this study. This process is used in this study to ensure the validation of information accuracy (Creswell, 2014).

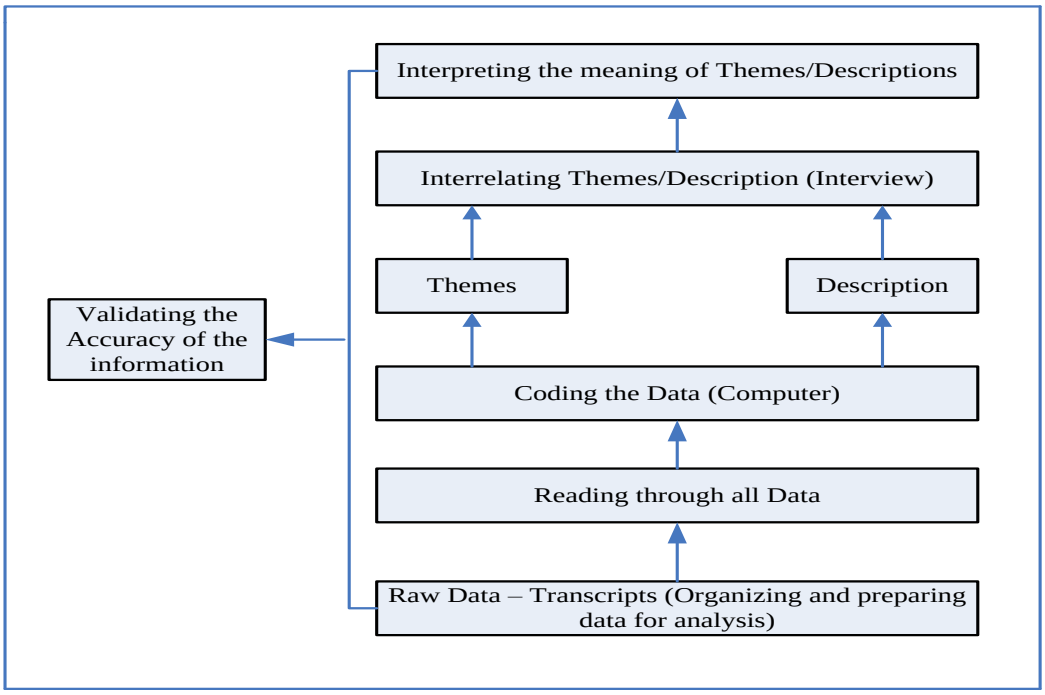


Figure 5.2: Qualitative data analysis process (QDAP) (*adapted from Creswell, 2014*)

The rigour and relevance of qualitative research is identified in the validity and reliability of the data, ensuring its consistency, applicability to the research problem and neutrality (Ellsberg & Heise, 2005). Furthermore, Ellsberg and Heise (2005) state that the accepted scientific qualitative rigour also depends on the trustworthiness of the research in order to prove its credibility. In this study, the validity, reliability, scientific rigour, trustworthiness and credibility are dependent on the analysis process (see Figure 5.2).

1. The components of Figure 5.2 are described and applied to this study beginning with ***Raw data (transcripts)*** – This first step organises and prepares the collected data for analysis which involves transcribing the interviews and sorting the data into forms according to the sources of the information (Ellsberg & Heise, 2005; Creswell, 2014). At this level of the process, the researcher comprehensively converts the data into a readable language in relation to what the participants said.
2. The second step involves the **Data reading** - This process involves reading and re-reading of the data transcription till the researcher familiarises himself with the content (Ellsberg & Heise, 2005; Creswell, 2014). Through this process, the reading guides the researcher in this study in identifying new themes and categories, associating relationships among the themes and categories and contradicting views from the participant's views.

3. **Data coding** – Coding is a way of organising the data by labelling them into codes to differentiate significant trends (Ellsberg & Heise, 2005; Creswell, 2014). The researcher used the coding to separate the texts from each other and to enable information sorting on the themes and categories. As Ellsberg and Heise (2005) and Creswell (2014) put it, coding can be done with a computer aid or manually. For this study, the researcher coded the text using computer aid on Atlas.ti statistical software as seen in Table 5.2. The researcher derives the codes based on content analysis, surprising (un-anticipated ideas from the beginning) and unusual codes (conceptual codes).
4. The coding process generates descriptions of the categories for analysis. The description includes detailed information about the study. The themes are the main findings and focus of this study. Table 5.2 of the study shows many perspectives from individual participants in support of direct quotations and evidence from the literature study. The researcher displayed the data using "narrative text" in a matrix and network technique (see Table 5.2) for the purpose of making the information more accessible (Ellsberg & Heise, 2005). To this study, matrices are organised coded transcribed data, arranged in rows and columns of themes (see Table 5.2), while networks are organised charts that show summarised information using pictures of the coded data (see Annexure K).
5. **Interrelated themes** – The process shows the way the description and themes are represented in this study. According to Creswell (2014), narrative texts are commonly used in showing the findings of the analysis. This study arranged the themes and descriptions into a table followed by the discussion of each theme and aligning them with each other with support from the existing literature.
6. A final step in the data analysis includes interpretation of the findings (Creswell, 2014). It also involves extracting meaning from the themes and descriptions (Ellsberg & Heise, 2005; Creswell, 2014). The interpretation is based on the lessons learned that focus on the comparison of findings, experiences, literature and existing theories. In this study, the researcher used data interpretation to indicate the actual contents of the themes and presented them to a meaningful information for the reader's understanding.

5.2.1.1. Axial coding (AC)

Axial coding involves examining relationships among codes (Mavetera, 2011). This process assists in building theoretical codes from one to another. The codes are grouped into sections called "families of codes." Families of codes are related to the area of learning culture, e-Learning culture and culture-oriented e-Learning system and the grouping of similar codes as

part of axial coding procedure. Table 5.1 presents the list of families of codes and the number of codes attached to each code family. The components of the table are based on the analysis of results from the whole research.

For an example, the family codes of *Student's culture contribution at the end of coding have different codes like student's culture; customisation, and target audience* (see Table 5.1). These codes assisted the researcher in delimiting the findings and suggestions. Then, the links among the codes and codes families were established using the network diagram (see Annexure K).

Table 5.1: Themes from Open Coding Process (OCP)

Code Family	No. of Codes	No. of Quotations
Student's culture contribution	5	16
Engaging students	4	13
Consideration of cultural factors	6	63
Representation and importance of content factors	4	26
Learning style assisting students	3	11
The presence of administrative factors	2	9
The presence of lecturers	2	11
The presence of Activity/Exercise Factors (AEF)	1	2
The implementation of culture-oriented factors	10	37
Culture-orientation in regard to community factors	2	17
System Development Methodology (SDM)	5	7
The problems encountered in the customisation of e-Learning system	6	17
The future of e-Learning system in SA society	4	7

5.2.1.2. The network diagram - Components of a culture-oriented e-Learning system

As indicated earlier, the network uses graphics for summary information deduced from the open coding. The network diagram provides the analysed and the deduced codes as were extracted from the coded data shown in Figure 5.3 and Annexure K in this study. This network provides the analysed components of the themes in Table 5.2 below using Atlas ti. Again, the network diagram assists the researcher to combine similar codes and families of codes into twelve (12) thematic parts as shown in Table 5.2. Importantly, these codes and families all contribute in the final design of culture-oriented e-Learning framework in this study.

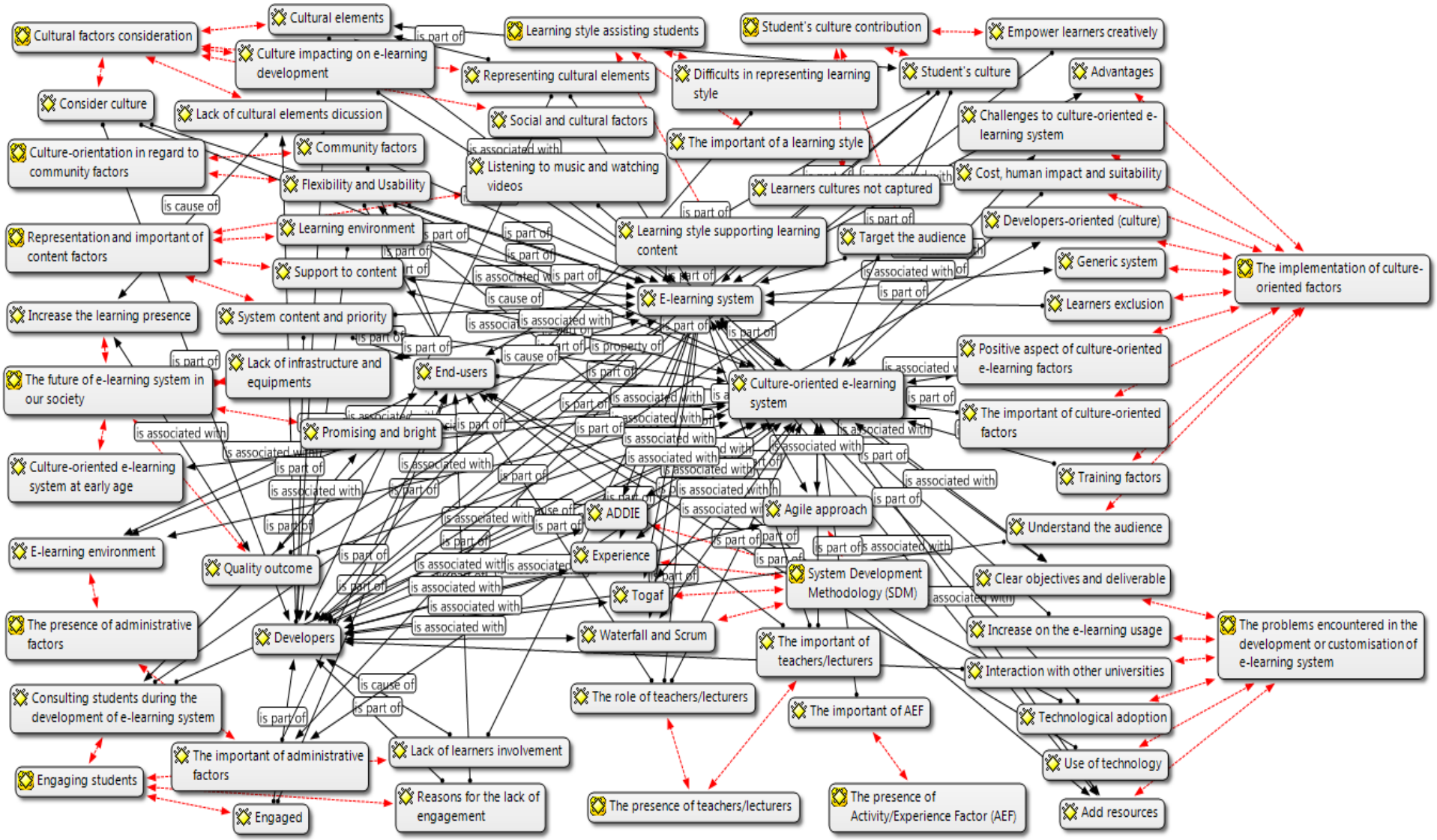


Figure 5.3: Generated Network of themes and codes (GNTC), Atlas.ti diagram

5.2.2. Thematic open-coding themes (TOCT)

As noted in the previous chapters (one and three and evidence of interview), the participants possessed in-depth knowledge, skills and experience in e-Learning design, development and customisation processes. The interview was face-to-face, written and conference video call (using adobe connect). The participants were given the opportunity to respond to the questions asked by the interviewer. The interview transcription was carried out using Atlas.ti coding method (computerised) in the qualitative data analysis. The process helped in determining data groups and creating themes and categories in the analysis. The themes and categories appeared from the research questions (see Table 5.2).

The data obtained from the individual interviews was analysed into understandable information. The thematic evidence of the interview results is presented in Table 5.2. The table consists of the research description and themes; all have a bearing on the application of Culture-Oriented e-Learning system that captures learners' cultures and also on e-LSDF. The themes formed the base in the final framework as validated by the cultural dimensions of the learners' detailed chapter two of the study. The descriptions are paraphrased interview questions while the themes were picked through content analysis (see Section 4.7.1) in chapter four. Each of the descriptions contained sets of subheading(s) of themes discovered and discussed.

Table 5.2: Thematic parts realised from the open-coding themes

Descriptions	**Themes**
End-users e-Learning system development	Students' culture contribution ✓ Students' culture ✓ Learners culture not captured ✓ Target audience ✓ Customisation ✓ Empower learners creatively
	Engaging students ✓ Consulting the student during the development of e-Learning system ✓ Lack of learners involvement ✓ Reasons for the lack of engagement (*Structure*) Academic Support Centres (ASC)
Consideration of cultural factors	✓ Cultural elements (*Learner language, Pictures, Reading, Policy, Beliefs, Communication, Knowledge and Symbols*)

	✓ Representing cultural elements (*English and home language*) ✓ Culture impact upon on the e-Learning system development (*Contributing to e-Learning design*). ✓ Lack of cultural elements (*Managing cultural differences*). ✓ Social and cultural factors (SCF).
Representation and importance of content factors	✓ Support of content ✓ System content and priority ✓ Listening to music and watching videos ✓ Learning environment (place) – comfort
Learning style assisting students	✓ The importance of learning style ✓ Learning style supporting learning content ✓ Difficulty in representing learning style (*Lack of knowledge, E-Learning environment, Individual differences, Learner's preference*)
The presence of administrative factors	✓ The importance of administrative factors (*Provide direction and support*). ✓ E-Learning environment.
The presence of teachers/lecturers	✓ The importance of the teachers/lecturers. ✓ The role of teachers/lecturers (*Major role player, Elicitation of requirements and Expertise*).
The presence of Activity/Exercise Factor (AEF)	✓ The importance of AEF
The implementation of culture-oriented factors	✓ The importance of culture-oriented factors ✓ The challenges to culture-oriented e-Learning system (*Resources challenges*). ✓ Training factors. ✓ Developer-oriented (culture) ✓ Generic system (*Challenges of the generic system*). ✓ Advantages (*Comfortable and Personalisation*) ✓ Disadvantages (*Cost, Learners exclusion and human impact upon and suitability*). ✓ Positive aspect of culture-oriented e-Learning factors
Culture-orientation in regard to community factors	✓ Community factors. ✓ Flexibility and usability (*Customisation of the features, Challenges of customisation*).

System Development Methodology (SDM)	✓ Agile approach and Scrum ✓ Waterfall model ✓ Togaf (The Open Group Architectural Framework) ✓ ADDIE ✓ Experience (medium and less experience)
The problems encountered in the development or customisation of the e-Learning system.	Cause of the problems ✓ Increase in the e-Learning usage
	Technology ✓ Use of technology. ✓ Technological adoption.
	Possible solutions ✓ Interaction with other universities ✓ Add resources ✓ Clear objectives and deliverables requirements
The future of e-Learning system in SA society	✓ Increase the learning presence ✓ Promising and bright
	Outcome ✓ Quality outcome ✓ Lack of infrastructure and equipment

These codes formed the base in the construction and validation of e-Learning framework in this study. An elaborate discussion of the themes in line with the literature study and partly with research objectives was done in section 5.2.3 in order to bring meaning and cohesion to the transcription as well as in the study.

5.2.3. Discussion of the open-coding findings

With reference to the research objectives in chapter one, the study centred on learning and learners' culture and development of a culture-oriented e-Learning framework. This section discusses the Table 5.2 above in detail in order to describe the themes derived from the open coding. The interview discussion quotes participants directly to buttress the findings. The quotation appear grammatically incorrect but these are retained as they were verbatim. As a matter of fact, the substantive dictum in this study contains grammatical mistakes. Nevertheless, the views and messages of the respondents are correctly articulated. The direct quotations were purposely done to get a more meaningful contribution from the transcribed

data and ensuring credibility in the study. The discussion also uses references at some points as provided in the literature to support the findings.

Most importantly, the themes are purely driven by the views of the participants (NWU, Wits and UCT) and in-depth attention is placed to them. Each participant is identified with the ***Interview Document Number*** ("INTDN0") from "INTDN01 to INTDN05" in order to reflect the anonymity of the respondents. The discussion that follows starts with the description followed by the themes headings which are in Italics.

5.2.3.1. End-users e-Learning system development

E-Learning system is developed for use by the learners in an effort to deliver quality teaching and learning outcomes. This section of the data discussion focuses on what it takes to build and implement such an end-user focused e-Learning system. The entire section also covers the contribution of students' culture and engaging students as viewed by the participants.

Contribution of students' culture

Students' culture contributes greatly to e-Learning system design and usage. The contributions of students' culture in the development of e-Learning were evaluated with the aim to simplify the place of culture in the development. INTDN01 states that "*perhaps at some stage*" it contributes in the process. This is an indication that a learner's culture is a contributing factor while developing e-Learning system. The following: students' culture, learners' culture not captured, target audience, customisation and empowering learners creatively are some of the components that make up students' culture contribution in the development.

Students' culture

The contribution of students' culture in e-Learning development is given more insight in this section of the discussion. According to Mohammed and Mohan (2011) and Al-Hunaiyyan (2008), learners' culture has been ignored in the development of e-learning platforms. Participants in this study acknowledged the importance of learners' culture, even though these cultures are not captured in the e-Learning system development because the system developers are lecturer-oriented. So, INTDN03 suggests:

"*So if you[r] targets are for people who prefer listening and watching the video, then, you should design the system to suit the preferred audience than reading because of social culture*."

Also INTDN05 concurred by saying that "*e-Learning systems must offer insight into the values, attitudes and behaviours of your students*", while INTDN04 proposed that "*it is important to capture culture in the content*" of e-Learning system. These findings prove that student culture contributes significantly in e-Learning development and designers ought to realise it with the responsible engagement with learner culture consideration in their development plans. The findings also illustrate cultural negligence by developers (participants) during the development process because there was no account of learners' cultural inclusion in their development plan. The discussion also extended to the yawning absence of learners' culture in e-Learning system development.

Learner's culture not captured

Bracken (2010) realised that educational challenges lie in how to capture and represent cultures on e-Learning systems while Al-Hunaiyyan et al. (2008) stressed the need to capture these cultures. According to Mohammed and Mohan (2011), culture has been ignored in the development process. Participants also acknowledged the fact that learners' culture is not captured or shown on e-Learning system development because the developed systems are developer and lecturer-oriented. In addition to this, King and Kimble (2004) state that designers should capture different user needs and expectations across the cultural lines. To underscore this point, INTDN01 observed that they are "*not really*" bothered to capture learner's culture in their development, while INTDN02 believed that learners' culture is "*not involved in the development*." This finding illustrates that learners' culture is not considered by developers (participants) during the development process, the reason being that learners are not consulted in the process. Therefore, achieving a culturally-oriented e-Learning system means that developers must understand the target audience in the learning environment and seek to include their culture.

Target and understand the audience

The users of e-Learning system are among the stakeholders in the development process. The effective delivery of good quality e-Learning system content goes with the developers' understanding of the audience who use the system as expressed by some participants. INTDN03 expressed the view that developers "*should design e-Learning system to suit the preferred audience than reading because of social culture*." According to INTDN05, "*considering your audience is always important*" during the development of e-Learning system

that is culturally driven. This consideration would allow the customisation of e-Learning system features.

This aforesaid understanding demands the knowledge, priority, needs and expectations of e-Learning system users and their computer competence. It indicates that enough information regarding priority, expectations of the system, money involved and other resources would be addressed as challenges confronting conventional and culture-oriented e-Learning system development. As indicated earlier, e-Learning system is largely developed without direct inclusion of learners which makes the system more developer-oriented than learner-oriented. Also, money and human resources are limited. This stands as the main challenge confronting learner culture inclusion. To address these challenges, participants advocate that developers consider audience because of the important role they play in the line development.

Customisation

Customisation can be regarded as a process of modification which is applied to e-Learning system features for a multipurpose. This process can allow the integration of learners' culture. According to García and Esteban (2013), culture-oriented customisation features are needed on MOODLE so that learners can input cultural features and attributes suitable to them.

One participant, INTDN03, suggested that e-Learning system should be customisable enough such that learners can "add an aspect of their language but not all of them" into the system. INTDN05 also believed that "*if students' culture is to be shown, recognised or captured in a digital environment, then the students should be the creators of such creative and cultural content*." These findings show that the e-Learning system should be designed in such a way that learners have the ability to 'unpack their culture in a digital format' along the learning curve in adding any familiar cultural features that would positively impact upon their learning processes and experiences. Participants felt that customisation is missing in the e-Learning system and their observations suggest that it is a sore omission.

Empower learners creatively

The ability to customise e-Learning system to suit each individual learners brings out the nature of creativity among learners. According to INTDN05, "*the students should be the creators of such creative and cultural content*" in the digital environment. This creativity comes in the form of modification and redesigning of the e-Learning system that includes adding and

dropping features to suit one's learning style and expectations. All this would contribute positively toward the integration of learner culture through diverse and individual engagement.

Engaging students

The implementation of e-Learning that is culturally balanced goes with the consultation with learners during the design, development and post-development phase. The engagement between developers and learners needs to be solidified for a greater quality development of the e-Learning system. The developers consult with the learners through the process of engagement. Nonetheless, INTDN03 indicated, "*Yes*" that they engage with the learners while INTDN05 said, we "*attempt to gauge who my audience is and engage with these students to try and help them grapple with making sense of its impact upon on the system on their lives*". Based on this, the developers also engage with the learners through dialogue in eliciting their needs and expectations.

Consulting with the students during the development of the e-Learning system

This subheading of the description is aimed at understanding whether developers consult learners (students) during development. Participants have mixed reactions to the question, however, according to INTDN01, INTDN02 and INTDN05, they consult the learners while designing and developing the e-Learning system. Nonetheless, the consultation is done by Academic Support Centres (ASC) without the developer's direct involvement. The consultation aimed to understanding the learners' "*want and expectations*" (INTDN03) in the system in order to deliver according to their specifications.

Generally, according to INTDN02, INTDN03 and INTDN01, the needs and expectations are drawn from the interview "*survey in order to get feedbacks*". The participants in the study affirmed the lack of full consultation and alliance with learners during the e-Learning system development stage because they have no direct contact or consultation with the learners. Rather ASC is the people that consult with other stakeholders. The engagement improves learner's involvement in the process.

Lack of learner involvement

E-Learning systems are challenged in the inclusion of learners' culture and experience in the design (Calvo, Ellis, Carroll & Markauskaite, 2007; CCSESA, 2011). Wang et al. (2012) argued for learners or students' full involvement during and post-development of the e-Learning system. However, the data indicate that participant's lack of learner involvement in

the design and implementation of the e-Learning system. Here is how INTDN01 stated it, there is a process of determining needs of learners but specifically we developers "*do not contact with the student directly*". This implies that learners' cultures are not considered or involved in the e-Learning development with reasons.

Reasons for the lack of engagement (Structure)

The lack of learner involvement in the development process is the result of ignorance and negligence from the developers. INTDN01 suggests, "*The reason we do not engage with students is because we have a specific structure in place*". Also, there is no common play ground between the developers and learners and INTDN01 puts it this way: "*to get common ground is our biggest problem*". INTDN04 believed that the lack of engagement is because of the "financial and human resource implication" to engage with the learners during and post-development. As a result of the lack in engaging with learners, however, ASC can be used by the administrators. This finding shows different reasons on the lack and it can be addressed by having proper structure in place.

Academic Support Centres (ASC)

There are different kinds of data gathering instruments used by ASC during and post-development period of the e-Learning system in collecting data. The instruments are: survey, focus group and interview in engaging with students. The finding illustrates limited engagement with learners without developers themselves but academic centres team handling the engagement. They said that ASC really engaged with students using a different medium in an attempt to provide quality input in the process.

5.2.3.2. Consideration of cultural factors

Cultural factors facilitate the execution of the culture-oriented e-Learning system. This section of the discussion seeks to determine those factors that necessitate culture-oriented e-Learning system development and usage. According to Lephalala and Makoe (2012), culture and its factors should be taken into consideration during the development phase. The following themes are discussed as part of the cultural factors' consideration mechanism:

Cultural elements (Learning language, Pictures, Reading, Religion, Policy, Belief, Communication, Knowledge and Symbols)

The integration process of cultural factors is challenging with regard to negligence as noted in chapter one for many reasons. This difficulty comes when representing cultural elements like

language, symbols and much more during the development stage of the e-Learning system. Nonetheless, the finding suggests that representation of language and symbols as cultural elements can be difficult; however, the challenges can be managed with the help of an effective framework like e-LSDF.

Though cultural elements are greatly important to participants, learners and the researcher, the establishment of these elements influences positively in building a culture-oriented e-Learning system that seeks to address the lack of culture on the design and implementation of the e-Learning system. Here are the expressions of the participants on the use of language as part of the cultural elements in the study.

INTDN01 states, "*I think language would be the most important factor to be considered*" when developing culture-oriented e-Learning system and INTDN04 concurred with the statement by saying, "*we need to find the resources to implement it*", in the process. On the contrary, INTDN02 believes that "*Language is not so important because you have to use a particular language that people can understand to develop but the type of instruction matters*". Generally, according to INTDN04, "*It is important to have everything in your home language*", in order to execute an effective culture-oriented e-Learning system.

Furthermore, participants believe in the use of symbols as cultural elements and INTDN02 stated that they "*use symbols and icons that are relatively common but most especially developing what students are familiar with*". While INTDN04 reacted, "*we are using symbols in all the languages in RSA*" (Republic of South Africa). Another element to consider involves the use of pictures which are cultural in nature. Then, INTDN03 expressed it in this way, in "*most cases pictures should be considered in e-Learning system*" because pictures are used to convey messages to learners. Again, participants, such as INTDN03, would like to see '*Policy and belief*' as part of the elements of the culture-oriented e-Learning system. The policy would force institutions to implements culture inclusive systems together with their belief. Nonetheless, the religious belief of the learners always influences the system choice because some religions are restrictive on e-Learning and others are not, INTDN01 believed that, "*religion influences belief and can impact upon on morality*" of the users of the e-Learning system. This means that learners' religious belief as a standpoint should be considered in the design of the e-Learning system. This policy could assist in building a dedicated application package for the computer centre to serve different cultural needs.

These elements must be managed and communicated to the right audience, though; participants felt that appropriate communication channels should be used in conveying and passing messages to the e-Learning platform. That means that participants want to have 'Communication' as part of the culture element to be considered in culture-oriented e-Learning system implementation. INTDN03 pointed out that cultural difference among learners can be "*manage through the medium of communication*". However, in accordance with INTDN04, "*the e-Learning system provides the base wherein the learners and teachers can communicate and share work in any language, or cultural way*". This means that communication is a connector in an effective culture-oriented e-Learning system.

In total, cultural elements influence how developers and learners "*understand, process, communicate, and manage data, information, and knowledge*" (INTDN05) in using e-Learning system and much more in the culture-oriented e-Learning system. However, this knowledge is confined to the learning environment. According to INTDN01, they "*get influenced by the knowledge of the e-environment*" (electronic environment). And also, they believe that "*knowledge is an important factor here, you may need understanding/skills to be able to use e-Learning system except if you are forbidden from using technology*". Nonetheless, the knowledge level of the users and developers will always influence the cultural aspect of the e-Learning system.

Representing cultural elements (English and home language)

Delivering on e-Learning system in a language other than in English is challenging, however, this section of the discussion tries to understand how participants represent language as cultural elements in an e-Learning system. Though the integration processes of cultural factors and elements are challenging in regard to negligence as noted earlier in chapter one, the challenges are backed by researchers like Olaniran (2009). As a matter of fact, participants agreed with the literature on the challenges in capturing language in e-Learning development. This challenge was also confirmed by INTDN01 who said, "*It would certainly be very difficult to manage*" language in the development as a result of icons, symbols and others. This indicates that learners' cultural differences impact upon on their beliefs which directly influence the usage and design of the e-Learning system.

Nonetheless, the difficult aspect of representing culture elements in e-Learning is also attributed to economic reasons. INTDN02 felt that "*It's not even visible*" to achieve cultural integration into an e-Learning system. The reason is that of the difficulty in capturing culture

on the e-Learning system. INTDN03 also stated that cultural recognition and representation can neither be "*in English or their own Language for them to understand the content well*".

Altogether, the findings suggest that, to achieve culture-oriented e-Learning system, there should be a gradual process in which one language can be recognised culturally after which others can follow. The idea was supported by INTDN03 who believed that "*we can start with an e-Learning system that recognised cultures*". Notwithstanding the challenges in the representation of the cultural elements, however, the challenges can be managed with the help of an effective framework like e-LSDF in the integration process.

Culture impact upon the e-Learning system development (Contributing to e-Learning design)

The impact upon culture in the development of e-Learning has been evaluated with the aim of simplifying the place of culture in the development. The consideration of culture in e-Learning systems development is very important in designing a system that can suit students from different cultural backgrounds (Boondao et al., 2009; Leidner & Kayworth, 2006; King & Kimble, 2004). However, participants were made to understand the context of culture in regard to this study during the pre-interview preparation for their readiness to actively participate in the study. However, INTDN01 voiced his concern in accordance with culture impact upon on e-Learning design, saying:

"*So yes I think cultural background has an impact upon*", but the issue remains in order to how to integrate it into the system. The participant continues by saying, "*all in all, I think as designers, culture factors are important and should be considered when designing an e-Learning system*". The inclusion is based on the impact of culture which is largely felt on the stakeholder's knowledge of the electronic-environment where the system operates; this environment has effects on the system input, output and usage.

Although the benefits and the significance attached to culture during e-Learning systems' development cannot be underrated (Mohammed & Mohan, 2011), from the literature, it is shown that culture is an essential component in the development of an e-Learning system. Based on this, the researcher aimed to determine from the participants a deeper understanding of the importance of culture in developing e-Learning. The participants acknowledged the fact that it "*is very important*" even at the level customisation of the e-Learning system by the developers (INTDN01). The reason is that it opens doors to disadvantaged learners of English.

Furthermore, the importance of culture in the development of e-Learning is certain but INTDN02 acknowledged the benefits "*but it comes in different ways*" in balancing cultures among the learners and the serving of a large number of usages remains challenging.

In addition to the existing facts on the impact of culture, INTDN03 concurred by saying, "*Yes, it has an importance in the e-Learning system*" while INTDN04 and INTDN05 also recognised the impact upon by noting, "*Yes culture can have an impact upon the development of an e-Learning system*". All these statements depict culture as very vital when designing e-Learning system but is overlooked by developers. At the end, INTDN05 believed that "*cultural factors and elements should contribute to how we design e-Learning*".

Lack of cultural elements (Managing cultural differences)

Globally, language differences pose challenges on e-Learning development (Olaniran, 2009). Based on this literature, ways of managing these differences should be considered in achieving the culture-oriented e-Learning system. According to Joy and Kolb (2009), cultural differences impact upon and affect learners beyond societal boundaries in SA (Ngugi et al., 2007). Again, cultural differences impact upon learners' learning style and processes (Joy & Kolb, 2009). In all of this, managing these cultural differences is inevitable and visible.

Nonetheless, participants are sure of the effective role played by culture, although the management aspect is only done in the content. E-Learning materials or content roles enable the integration of the culture into e-Learning system. INTDN01 believed that managing cultural differences among learners is made 'possible through the content', because contents are the interacting point for the learners and the discussion of a cultural element, "*must be a more important priority*" to talk about in order to achieve a culture-oriented e-Learning system. In the same manner, INTDN01 said "*We do not*" discuss culture or its elements during the pre and post-development stage of e-Learning.

There is lack of discussion of cultural elements among the e-Learning stakeholders because none of the questions that developers ask "*focuses on cultural inclusion/expectations*" during the consultation process (INTDN02). Participants never thought explicitly about asking learners about their cultural background on e-Learning system development. But INTDN02 believed that it is "*very necessary*" to understand learners' culture and ways to integrate them into the system and engage with them continually. However, according to Mohammed and Mohan (2011), culture has been ignored in the development. Participants also acknowledged the fact that learners' culture is not captured or shown on e-Learning system development

because the systems are a developer and lecturer-oriented as noted in this study. Furthermore, INTDN02 attributed the ignorance or lack of discussions to the fact that developers "*don't really focus on students' culture or cultural factors*". In another way, this lack can be attributed to little or no research on the culture-oriented e-Learning system. Therefore, INTDN02 confirmed that "*there is not a lot of research yet on cultural factors on the e-Learning system*".

The team of developers' views and discussion also show lack of cultural elements which resulted in the absences of concrete discussion of learner culture in the development and understanding the implications thereafter. Rather, INTDN02 expressed the view that they "*expect usability issues to reflect on cultural issues*", more than the consideration. This shows that the importance of the usability of the system had been a focal point of discussion among the team of developers while designing e-Learning rather than culture per say. From all indications, capturing culture demands an understanding of the systems usability as noted by participants on many occasions, but their expression is not reflected in the current system contents.

Again, the researcher deduced that institutions are not considerate when it comes to culture while developing e-Learning system as expressed by INTDN05 "*no*". Participants' views are made known because their institutions do not design or develop e-Learning systems in another language. However, managing these cultural differences remains challenging and difficult, but e-LSDF brings the solution in design and management. Nonetheless, culture and its factors can be influential in the development and usage of e-Learning; however, such are not observed or noted or confirmed by participants: The exclusion can be the result of challenges. Also, Epignosis (2014) noted that e-Learning development lacks culture-oriented mechanisms or factors. Again, Olaniran (2009) confirmed lack of culture as a major challenge to e-Learning system globally. At this point, cultural influence and its impact upon have been ignored by e-Learning promoters (Mohammed & Mohan, 2011). From all indications, both the existing literature and the participants' views suggest lack of cultural element and factors discussion during the development of e-Learning system not with minding the influence or impact upon.

Social and cultural factors (SCF)

As noted in the previous section of the study, the e-Learning system lacks cultural elements and is challenged, there is a need for the consideration of social and cultural factors (SCF) while developing e-Learning system. Nonetheless, the delivering of culture-oriented e-Learning system lies in social and cultural factors (SCF) of their real influence. However,

participants are keyed in developing an e-Learning system that will benefit all users from different backgrounds and culture. INTDN01 noted that the outcome and usage of e-Learning system are greatly "*influenced by the knowledge of the e-environment*", this environment is dominated by social norms and learners cultural factors.

INTDN05 states that "*there are both social and cultural factors that need to be considered when designing learning activities to be used on-line*". These factors can be achieved through the integration of cultural elements, understanding and considering the importance of culture on the e-Learning system and developers discussing them while designing and developing the e-Learning system. And also the consideration of Hofstede's cultural dimensions in the development process is crucial. The consideration of culture should be integrated when planning the development methodology. Continually, INTDN05 recommends that at the methodology stage, "*considering the culture (the ethnicity, religion, gender, and socioeconomic background) of your students will assist you to understand the nature of the problem you are trying to solve*", after which the role and representation of content factors can be determined.

5.2.3.3. Representation and importance of content factors

This is the third description in this discussion with a number of themes. Content factors remain a important and needful part of e-Learning system development and content management. A factor is an identifiable quality part of e-Learning (CCSESA, 2011). Also, content factors are those materials that influence the learning process and satisfaction like a study guide, textbook, hand-out, journals, magazine and many more. These components ensure that a different system is developed. This section aims to seek how these factors can be represented as well as their importance in the development of the e-Learning system. The following categories emanate from the interview question starting with quality content as important element in representing content factors:

Any e-Learning system aims to boost the quality of teaching and learning. Participants suggest the representation and consideration of quality as part of the attributes of content factors in the e-Learning system. To backup participants' views and inputs, Sun et al. (2008), believed that a good quality and well-designed content should be considered when designing e-Learning materials. Contents are designed and delivered according to learners' needs (FAO, 2011). It is clear faculty members, lecturers and managers are content oriented in the development and implementations of subjects but contents are not part of the system. But, according to our

finding, lecturers are instrumental in managing contents and tools within the system in order to suit learners individually.

At this level, teachers/lecturers assist in representing content factors. They play a central role in the administration of e-Learning content, specifications and editing. Participants believed that lecturers and their roles should be recognised in the execution of content factors in order to facilitate culture-oriented e-Learning framework. The provision and availability of these learning materials and support are teachers' responsibility (Barik & Karforma, 2012). The responsibility of lecturers is enhanced by support centres. The support centres consolidate the link, corporation and input between teachers/lecturers and learners and presenting them as a structured content that appeals to learners. Based on their support, it is important for developers to understand the needs provided by the ASC departments and implement a system that provides solutions to their needs. Nonetheless, e-Learning system should provide support (Oye et al., 2012). In view of this, participants suggest the consultation with the support centres in presenting content factors on e-LSDF.

Support of content

In determining the actual SA culture that encourages e-Learning system development or usage an understanding of the main factors or elements to be included in support and development of learning content must be sought. According to INTDN02, developers have the responsibility "*to deliver proper content*" in the e-environment. Other participants like INTDN04 believe that:

"*It is important to capture learners' culture in the content, as there are a lot of different cultures in South Africa and the learners will determine the culture within the module of learning*".

Based on the knowledge of the participants, it is important to identify SA culture that encourages e-Learning development and usage and this culture can only be retrieved from the learners. The affirmation is supported by INTDN01 who said that cultural content factors are "*very possible because e-Learning system got to do with the content*", because learning content is the centre point of interaction for the learners in the e-environment.

However, determining these contents can only be possible through collaboration, consultation and content execution in any language. Participants believed that this mechanism is lacking in the current system. Nevertheless, INTDN04 thinks that "*it is important to capture culture in the content, as there are a lot of different cultures in SA and the learners will determine the*

culture within the module of learning". From all indications, supporting learning content assists in representing the importance of content factors on culture-oriented e-Learning system administered by administrators (personnel). However, according to INTDN02, "*most importantly personnel management is essential in evaluating the experiences of students in the e-Learning environment*". This evaluation helps in representing content factors which directly support learning content. The support plays a major role in the work of lecturers and administrators with emphasis on system content and priority.

System content and priority

System content is a vital point in the learning process which provides materials to users. According to Ebrahim (2009) and CCSESA (2011), education institutions are challenged in gathering learning system contents. Non-English speakers are restricted in some degree of content (Olaniran, 2009). Sun et al. (2008) believe that quality content assists in satisfying learners' learning expectations. Participants accept the inclusion of content factors in these learning contents in order to satisfy learners; the avoidance of content factors risks learners from different backgrounds.

However, the role of content factors is executed through the recognition of system content and placing priorities on what matters to learners. Participants confirmed that managing cultural differences among learners in developing e-Learning rests on culture, while this culture should be facilitated through system content, priority and usability. According to INTDN01, "*we manage the cultural differences in the content and not the system*". Through quality management, the cultural differences among the learners are recognised because of the role played by system content in e-Learning development and usage as viewed by participants.

The execution of system content and priorities is really facilitated by teachers/lecturers who are the important people to determine content requirements, the students' level of experience and knowledge. Their role is also vital in every operation of the e-Learning system and implementing its tools and contents. Based on this, INTDN04 say, "*lecturers are the main role players in the development of the content within the system" to satisfy users*" expectations. This consideration is made possible through a survey and interviews to determine content requirements. INTDN04 further says that content factors are "*handled within the content*". The aim is to make 'everyone feel comfortable in his/her learning environment' thus accommodating learners across races.

However, among the challenges encountered in the e-Learning development is determining the highest priority of users. A statement from one participant raised the problem of determining "*the needs with the highest priority of users because the users are large*" (INTDN01). This is always challenging and difficult to achieve. Inversely, INTDN02 states that system content and priority is challenged due to the fact that the universities have a very wide range of students engaging with e-Learning content and "*there is no particular structure determining*" their priorities and expectations during the development phase. Though the challenges can be solved by "*knowing whom your users are and trying to satisfy their needs*" (INTDN02) continually. As the participants have noted, managing learners' cultural differences and representing content factors are possible and achievable but only through material content, priorities and availability of resources.

Listening to music and watching videos

The practice of listening to music and watching videos is another way of achieving system content and priority. System content remains the platform where learners actively engage in the learning environment. This section is a follow-up on system content that participants would like to include in representing content factors. The fact remains that there are different learning style used by learners in the e-environment. Based on this, INTDN03 thinks, "*from experience, majority of the students don't like reading, they like to listen or watch videos while working. If e-Learning system can be accommodative so those students can learn while listening to music and watch video*". This push for a call that e-Learning contents be represented in diverse format like in audio and video across languages for learners' selection based on their learning style. Furthermore, INTDN03 believes that diversity in format "*will allow and accommodate people to study while playing audio and video; those that prefer to study in a silent environment*" will enjoy the liberty. However, cultural differences impact upon learners' learning style and process at large (Joy & Kolb, 2009).

Learning environment (place) – comfortable

Another area of consideration in representing content factors is the learning environment. The environment is where the learning occurs and influences the ways through which learning takes place and the outcome thereof. The condition of the environment determines whether learners will feel comfortable engaging in the learning process or not. Based on the power of the learning environment, participants expressed their opinion in the following ways on the effect of culture on learning outcome. INTDN03 strongly believes that "*the environment where the*

student operates and the e-Learning system is based should be accommodating to everyone" in the learning process. INTDN04 support this view by saying "*everyone must feel comfortable in his/her learning environment, and the content needs to be presented in such a way*" that learners are able to understand and share information effectively.

Culture-oriented e-Learning system promotes good learning style in a way that "*it provides a comfortable learning environment*" (INTDN04). Teachers provide such learning environment that promotes learners with good learning style. Here is how INTDN02 expressed concern about that environment, "*it is important to implement tools within the system in such a way that it will provide a learning environment that suits more than one learning style*". This environment is organised digitally and INTDN05 believed that "*if student's culture is to be shown, recognised or captured in a digital environment, then the students should be the creators of such creative and cultural content*". Also, INTDN05 suggests that, "*the learning resources used in a system should keep to the conventions of the discipline and field wherein the studies take place*".

5.2.3.4. Learning style assisting students

Our learning environment is filled with learners across learning style and needs (Boondao, Hurst & Sheard, 2009). Understanding their learning style is vital because it has bearing on learners benefiting in the learning process. The following were noted from the descriptions:

The importance of learning style

Cultural differences impact upon learners' learning style and process (Joy & Kolb, 2009). Participants accepted the influencing power of learning style on learners in the development of e-Learning system. In verbatim, one participant said:

"*I believe that learning style is a very personal thing. I think Tswana people's learning style differs, some people like writing, other people like writing on screen, whatever*" (INTDN01). This indicates that cultural diversity among learners directly influence the way by which they interact with the e-Learning system and engage in the learning process.

Learning style supporting learning content

As noted earlier, learners engage and participate in the e-Learning platform through the learning content which is facilitated by administrative factors and lecturers. Administrative factors are the factors that ensure the gathering of statistical data, content and course evaluation and document in order to ensure that learners are presented with effective learning styles. This

specifies that learning content is the centre point which connects teachers and learners as organised by administrative factors. The support of learning style is purely seen in the learning contents of an e-Learning system, so, these contents should be culturally presented for learners to have opinion on which language format to use.

On this account, participants state that learning style assists learners to remain focused in the learning environment as well as on the culture-oriented e-Learning system platform. In support of learning style on learning contents, INTDN01 expressed the view that learning style is "represented as content and what students do with their content is their decisions". This means that learning style should be gathered, captured and represented as a learning content but the structures in which it is arranged is the learners' responsibility.

A participant said, "*well, I would say personnel are very important but most importantly personnel management is essential in evaluating the experiences of students in the e-Learning environment*" (INTDN02). INTDN04 states, it's the "*responsibility of the lecturer and ASC departments*" to identify the right learning style that supports learning content and effective to learners. Also, it is the teachers/lecturers role to "*implement the tools within the system in such a way that it will provide a learning environment that will suit more than one learning style*" (INTDN04).

Difficulty in representing learning style (Lack of knowledge, E-Learning environment, Individual differences, Learner's preference)

Cultural differences impact upon learners' learning style and process (Joy & Kolb, 2009). In accordance with participants' views, e-Learning system lacks learning style with realisable solutions. However, every individual learner has a varying learning style that affects his/her own learning process. The participants accepted the influencing power of learning style on learners in the development of e-Learning system but realised that challenges and difficulties abound. One participant said, at the end of the day, learners are expected to "*learn and developers ensure that they learn very well. That is our responsibility so if we can learn from our past to better their future. I think that is what analysis would do. I just think that our knowledge is not 100% there yet*" to pilot the process (INTDN01). They believe that developers lack absolute knowledge and skills to initiate varying learning styles on the e-Learning system. It's also believed that developers can manage the learning style by providing learners with a lot of options in the learning environment. At this level, there are various kinds of difficulties opposing learners' style representation. The challenges are listed below.

The flexibility of the e-Learning system brings accommodative learning styles in alignment with cultural features and attributes. Nonetheless, the understanding of the cultural difference in relation to the management of cultural variances is important. But participants acknowledged the fact that they lack the knowledge of learning style of the learners. INTDN02 indicated that developers "*don't use learning styles at a design level broadly speaking, we believe in the flexibility of students*". However, developers lack proper knowledge to elicit learners' expectations, system contents and priority.

Furthermore, the difficult in representing learners' learning style is also attributed to lack of e-Learning environment. The existing conventional learning system cannot be used by administrators to execute and implement varying and flexibility cultural differences among learners in the e-environment. INTDN02 believes that, "*personnel management is essential in evaluating the experiences of students in the e-Learning environment*". As a reminder, e-environment is an environment where e-Learning operations are organised. Participants see the environment as where the students operate and would like to see "*e-Learning system accommodating to everyone*" (INTDN03).

Learners' preference is also regarded as a source of contribution to lack and difficulties in capturing learning style on community factors in the design and development of e-Learning because learners have not voiced out their preference. At the moment, learners felt their preferences go in hand with their learning styles which assist them in the learning environment development while their preferences are largely ignored. Meanwhile, the role of support centres and lecturers helps in positioning learning style at the heart of culture-oriented e-Learning system as articulated by participants. The establishment of a culture-oriented e-Learning system usually involves learners' differences, understanding the kind of students that use the system, their expectation, needs and technological knowledge and many more. All these must be considered because they are directly assisting in the execution of the e-Learning system that is culturally bound as recognised by participants.

In general, developers also declared difficulties in capturing different learning styles by saying, "*it is difficult to have a system that satisfies everybody*" (INTDN03). And INTDN05 believes that it "*is difficult for a single designer as it requires them to pay attention to individual culture and the ways life is lived in different communities*". Individual differences have impending negative effects on capturing learners learning styles because they demand developers'

knowledge, economic resources and deeper understanding of differences among learners which are difficult for developers to achieve.

5.2.3.5. The presence of administrative factors

The execution of e-Learning to appeal to learners continually is well facilitated by the duties and role of administrative factors. This section deals with the administrative factors which form an integral part of our e-Learning operation.

The importance of administrative factors (Provide direction and support)

According to Georgouli et al. (2008), administrative factors ensure gathering statistical data, content and course evaluation, documentation and monitoring the e-Learning process. For this purpose, the section seeks to determine the importance of administrative factor from the participants' viewpoint. Administrative factors are important for the fact that they help in providing support in the development, implementation and administering conventional and culture-oriented e-Learning system. The support is a vital part of the equation for a successful e-Learning system.

Also, administrative factors involve IT managers who "*would obviously help a lot in building the architectural basis but I think in the software development input, I think there would be a need for a lot of inputs from administrative factors*" (INTDN01). They are also the actual people that decide on the learning content with teachers and facilitate in the implementation processes. In accordance with participants, the alignment of content factors with the support of administrative factors is important when developing, and implementing the e-Learning system. Participants believed that it is the duty of the administrative factors to "*deliver proper content but I must tell you that the university has a very wide range of e-Learning content*" (INTDN02) but none is dedicated to determine learner's preference.

Again, participants trust that the factors offer direction to how things should be done in the development, they also offer evaluation as noted by participants who said that they are important in "*evaluating the experiences of the students in the e-Learning environment*" (INTDN02). Furthermore, a participant believed that "*without administrative personnel, there would be problem of continuity, monitoring and management of the e-Learning system*" (INTDN02). Reason, they are the people that would understand the content or learning styles that are influential and perhaps position them in the development of the e-Learning system or the environment.

E-Learning environment

As a reminder, culture affects the environment where learning takes place, this environment impact upon learners learning and productivity. This section aims to understand the role and how e-Learning environment informs the decision of administrative factors in the design of e-Learning system that portrays learner culture. Participants believed that they are informed and "*influenced by the knowledge of the e-environment*" (INTDN01) where the system implemented and the infrastructure involved.

The knowledge of the e-Learning environment should be at a level where "*everyone must feel comfortable in his/her learning environment, and the content needs to present it in such a way*" (INTDN04) that learning is productive. The environment is also impact upon by teachers' roles and INTDN04 believes that teachers play a role in implementing "*tools within the system in such a way that it will provide a learning environment that suits more than one learning style*". INTDN05 states that "*learning resources used in a system should keep to the conformity of the discipline and field wherein the studies take place*".

5.2.3.6. The presence of teachers/lecturers

The presence of teachers/lecturers is vital in every aspect of learning and the e-Learning process in partnering with other stakeholders to ensure that proper format is initiated and used.

The importance of the teachers/lecturers

Teachers/lecturers are important people in e-Learning system; the students' level of experience and knowledge all depend on the teacher/lecturer (CCSESA, 2011). Their roles are vital in every operation of the e-Learning system and in implementing its tools and contents matters to learners. Indications have proved that they are the most important people in the development because they know what the students want and the system specification in terms of content. Also, teachers/lecturers provide and customise the kind of learning environment that is suitable and accommodate students with different learning styles. As a major role player in the content development, a participant suggests that teachers have the "*role to implement the tools within the system in such a way that it provides a learning environment that suits more than one learning style*" (INTDN04).

The role of teachers/lecturers (Major role player, Elicitation of requirements and Expertise)

This section of the discussion deals with the deeper roles of teachers/learners in e-Learning and the culture-oriented e-Learning system. Participants believed in the need for the inclusion of

teachers in the design of e-Learning system and framework. According to the participants' views, teachers/lecturers are "the most important people" in the development, "*they know the best on how students learn, the experience of the students and they provide necessary features that go into system*" (INTDN01). As a major role player in the execution of culture-oriented e-Learning system, the participants expressed the desire to help in designing and developing learning contents, gathering expectations, experience and needs, establishing cultural difference, understanding what the learners want and their desires, the system requirements and standard. INTDN01 was bold to say, "*so if the lecturers, designers develop content for e-Learning system and I know the profile of the student, therefore, the cultural difference will be possible*". They are also seen as centre point of contact to deliver material to the users. INTDN02 indicates that "*the university decides on the choice of the technology to be used and the teachers basically decide what part or culture should be included in the system based on students expected*".

Generally, participants also suggest that teachers' role involves deeper understanding and knowing exactly what they want in the e-Learning system and the expectations of the system. They also provides detailed information and likewise agreed on the role of lecturers in the area of gathering or acquiring and knowing learners' requirements during development, providing support, inputs and expertise in the design of e-Learning contents in order to a structure well manageable and quality system that appeals to all learners. The vitality of this factor was supported by existing literature, with the belief that they are intermediate persons between administrators and students, content, learning and activity in administering other factors in the learning environment influenced by cultural factors (Georgouli et al., 2008). According to Lubega and Mugarura (2008), teachers design learning materials that concur with methodological standards. At this level, INTDN04 states that "*lecturers are responsible for the content and it can be developed according to the students in the class*". However, teachers are also responsible for providing suitable learning style appealing to learners at large.

5.2.3.7. The presence of Activity/Exercise Factor (AEF)

The discussions continue on AEF. The effective management of students' academic-related work or activities by the tutors or teachers is handled by AEF (Georgouli et al., 2008). The factor manages anything related to academic work like assignment and others, participants see it as important in making learning contents easily understandable.

The importance of AEF

All the features and tools added on e-Learning make the system easy and effective to use in promoting teaching and learning. Making e-Learning system usable depends on AEF. In achieving this, it is believed that development is done using conventional pattern and nothing extraordinary. Also, participants believe in the ability of e-Learning to provide contents across cultures and language, they approved cultural presence to all the features of the e-Learning system. Therefore, e-Learning features, icons and others should be structured and presented in a simply manner to enhance learning. Through the conventional method, AEF is regarded as factors worthy of consideration in e-Learning system design.

However, participants believed in the importance of AEF in an effective running of e-Learning and more culture-oriented e-Learning system. A participant (INTDN01) states that, "*I think it is very important*" but lacks the specific knowledge of how to include all of its functions in the cultural presence. Well, there should be a culture-oriented function for downloading and uploading stuff and together with announcements, comments, chatting and reading. Again, well executed AEF will provide learners (users) and teachers with good playing ground to share and communicate using any language supported by participants.

5.2.3.8. The implementation of culture-oriented factors

Different aspects of culture-oriented factors have been mentioned in this study with the view to provide and construct e-Learning framework that accommodates learners across tribes, cultures, background and ethnicity. Each of these contributes positively to building a culture-oriented e-Learning system as noted by participants and in scholars' papers. According to one participant (INTDN01), these factors are very "*important*" in e-Learning as well as in culture-oriented e-Learning system design (refer to interview questions (Annexure A)). This section of the discussion aims to provide a discussion on the implementation of culture-oriented factors.

Although the possibility of achieving culture-oriented e-Learning has mixed reaction among the participants due to challenges, some participants felt it's achievable and for the system, while others opposed it as noted in the description that follows:

The importance of culture-oriented factors

The call for culture-oriented e-Learning system comes with advantages which make it worth implementing. Indeed, it was realised that learners would feel nice if they saw their language in the e-Learning system, indicating system acceptance from the users.

In an attempt to validate the importance of these factors noted in this research, one of the participants observed, these factors are "*very important, because there are words you cannot understand in English, but you will understand them better in your mother tongue*" (INTDN03), which affirmed the importance of these factors to the audience (learners) as well as INTDN04's views that it is "*important to have everything in your home language*". It all indicates that participants believe that all these factors are absolutely important in influencing e-Learning within a culture-oriented e-Learning system. Also, these factors are very important because of the amount of value placed on them by participants and students as seen in the quantitative analysis (see chapter six).

The challenges of culture-oriented e-Learning system (Resources challenges)

Culture remains the focal point in this study in an effort to construct culture-oriented e-Learning framework as supported by the participants who also admitted the absence of culture in all the factors mentioned above because e-Learning systems are based or focused on developers and lecturers own culture, and learners are indirectly marginalised. This is achievable, "*but it can be difficult*" to develop a system in a different language and have all culture or language in one (INTDN03). However, this deficiency can be blamed on lack of good content or development and limited resources which can be regarded as a challenge.

Culture-oriented e-Learning system is challenged because developers focus more on the technology and not on learners' culture because they "*have to choose things because of the cost so that we can do more*" (INTDN01). In all these, building good quality e-Learning means making the system more culture-oriented, flexible with the availability of resources.

The challenges begin with the availability of resources (time and money) which assist in the establishment of the e-Learning system. According to Oyelami (2008), access to educational contents and resources is enabled by the e-Learning platform. But a participant (INTDN01) believes that, "*it is not economic or viable to create a language system*" in South Africa, however, some e-Learning systems allow for the changing of the basic language of the e-Learning system like it's done in Spain, allowing learners to customise system features, though it takes a lot of time and money. But, INTDN04 suggests that a culture-oriented e-Learning system can be offered "*in different languages, but this has a financial and human resource implication*".

Participants consider resources like money and time as important elements but they implicate the execution of e-Learning negatively and positively. The negative aspect is felt in the limited

time to implements the culture-focused e-Learning system. Funds to design and implement culture-oriented can be higher than conventional e-Learning system. Nonetheless, participants agree with PPT (2009) who believes that budget and time influence the execution of e-Learning system. However, resources affect the cultural factors, learners profile, technological acceptance and usage in discussing the technology aspect. INTDN01 felt that "*technology is fast changing and the challenges come in money and time and resources availability*" to the developers. Again, the execution is challenged on the account the limited infrastructure and its high cost. The view is agreed to INTDN04 who says, the e-Learning "*infrastructure in SA is limited and very expensive*", to implement and customise in another language.

As noted above, culture-oriented e-Learning is heavily challenged on time and cost. Very expensive to develop the e-Learning system in another language. This means that the system in any other language can hinder its 'economic visibility'. Again, it would be difficult, especially when the developers do not understand the language to use, resulting in the difficulties in the design. However, many participants believe that it can be achieved in all e-Learning platforms when the will is there, although the interview finding revealed that sometimes developing English content is easier to understand than other languages especially Afrikaans.

In another way, culture-oriented e-Learning system is also challenged by INTDN02 who argues that it is not possible to achieve such system and INTDN03 thinks that culture-oriented e-Learning will be negatively affected by learners "*reading*" in a different language. This challenging is made worse by human and finance impact upon as well as the technical and human expertise needed to construct, and maintain e-Learning that is aligned with culture and which is hardly available. The financial (capital) implication in developing culture-oriented e-Learning is massive and expensive compared to conventional e-Learning system without cultural consciousness. On this account, both challenges and many others amount to negative impact upon which affects the cultural influence on e-Learning design.

Training factors

Culture-oriented e-Learning research papers are limited in publication, and it can be said that many have no idea about culture related e-Learning system. In order to execute a fully functional system, users and administrators must be trained and be acquainted with the operations. Nonetheless, the participants would like to have training as part of the factors in culture-oriented e-Learning system.

Developer-oriented (culture)

This section of the discussion covers developer-oriented training in order to understand participants view because the literature studies indicate that current e-Learning systems focus more on developers than learners. This view indicates that most systems align with the developer's culture, language and background. Equally, participants accept the fact that current e-Learning systems are designed based on the developer's culture. So, INTDN01 acknowledges that they understand, "*If you design a system and consider the law, you will think in the line of grows and security and the things like that. So it makes sense that a designer's personality counts*". This is to say that developers are not worried about learners' culture and background while designing or developing the e-Learning system. INTDN02 thinks that developers don't "*focus on cultural factors*" while the development is on, rather they are limited to their own culture. Their focus also is limited to the conventional system which impact upon on the culture-oriented system, thereby lacking customisability.

Generic system (Challenges of the generic system)

Generic system influences system development in such a way that it allows customisation in general across learning boundary. According to Alzaghoul (2002), cultural consideration and its understanding is associated with the usage and development of the e-Learning system. All participants indicated the generic system as impact upon culture in the development of e-Learning system and its usage because most of the systems are developed using English as the medium of instruction. As a matter of fact, e-Learning systems should be designed in the "*things that will benefit everybody*" in the learning cycle (INTDN01).

Another challenge regarding the delivery of culture-oriented e-Learning system comes from a participant who believes that most of the current e-Learning "*come from North-America and is basically more of a generic system developed to suit just any organisation*" (INTDN02); however, cultural factors can be incorporated into the same system, but participants are not sure how to implement such into the system. This indicates that e-Learning systems are developed conventionally based on open source which lacks generic input.

Another participant (INTDN02) thinks that they largely follow "*the conventional pattern that students are used to*" while developing e-Learning system. This finding suggests lack of cultural factors or features during the development and customisation stage, resulting in the conventional nature of the system. In addition there is no place for learners' culture in the development (McGonigal, 2005; Wilson & Peterson, 2006). The finding also suggests the

absence of culture-orientation in a generic system used in facilitating the e-Learning process, as well as impact upon culture.

In adding to the challenge, another participant (INTDN04), seems to be vocal to say that e-Learning "*systems developed all over the world*" are based on open source including the popular belief that e-Learning system should be more generic to accommodate individual learner culture and preference. In the light of all these views and suggestions, it can be said that culture-oriented e-Learning is achievable, against all the difficulties, through a generic system.

Advantages (Comfortable and Personalisation)

The implementation of culture-oriented e-Learning can be advantageous due to the fact that learners will feel comfortable because the same system can accept individual culture and language personalisation promoting an adaptive and inclusive learning environment. The integration of cultural factors in the e-Learning system also promotes a comfortable design and are innovative system which is customisable in making e-Learning culture-oriented and achievable. However, the customisable aspect will allow developers to think inwardly and learners will relate the learning content to things they can feel and touch around them. This view is supported by participants who suggest that culture-orientation is advantageous because it provides a comfortable learning environment for the learners across divers learning environments. Culture-oriented e-Learning system can also be advantageous because learners can "*feel nice if they see their own language*" represented on the system" (INTDN01). The advantages are felt currently at any stage and according to INTDN01, the e-Learning system together with the culture-oriented system has a "*huge advantage for the learners*" both now and in the future, because it allows learners to learn perfectly or improve on another language (than English). The discussion is extended to disadvantages.

Disadvantages (Cost, learners exclusion and human impact upon and suitability)

The implementation of a culture-oriented system comes with disadvantages which are seen as discomfort in the design and usage of the system. According to INTDN04, the execution of culture-oriented e-Learning system "*has a financial and human resources impact upon*".

The disadvantages are the result of the cost, human impact upon and suitability of the system. As previously indicated, the cost constraint of culture-oriented e-Learning system stands as a disadvantage. For instance, a participant noted: "*it have a financial and human resources impact upon*". This brings negative impact upon due to limitations to the system. As a

summary, the findings include comments from INTDN01 who states that: "*the cost and the exclusion of people would be the biggest disadvantages*" of culture-oriented e-Learning, Suitability is also seen as a major disadvantage. Based on these views, the culture-oriented system is expensive to develop and would not be suitable for all. On this account, the system can lead to learner exclusion; according to the participants, culture-oriented e-Learning is disadvantageous because "*not all cultures will be satisfied*" (INTDN03) and many learners will be excluded from the learning platform.

Nonetheless, INTDN04 argues that "*anything is possible if there is enough money and human resources*" to invest in culture-oriented e-Learning system as a priority. By exclusion, is meant that if there is a discussion in a language which others don't understand they would be excluded from the group/discussion because of language deviation. However, the idea of culture-oriented e-Learning system is still attainable, but "*cost and suitability*" (INTDN05) remain a concern for the developers.

Positive aspect of culture-oriented e-Learning factors

There is a positive image that follows a culture-oriented e-Learning system in a way which allows customisation and personalisation of the system contents and features enabling learners to understand the content in their language and many more. INTDN02 states that culture-oriented "*factors have influence*" on the e-Learning system. This indicates that the implementation of culture-oriented e-Learning system demands the consideration and understanding of the positive side of the system.

5.2.3.9. Culture-orientation with regard to community factors

The misrepresentation of culture in community factors is examined at this level. Some participants felt the, need for the representation of community factors as cultural factors as done in English. Nonetheless, the community factors ensure effective communication, collaboration, dissemination and gathering of information and working with course-mates in group discussion forum, chat-rooms, news, announcements, wiki, bulletin and others (Georgouli et al., 2008). Learners use these tools to stay connected and united in a community forum of learning though these factors are lacking culturally. The followings themes were noted:

Community factors (CF)

There is lack of culture-orientation among community factors; as earlier noted, this lack affects the design of e-Learning inclusively. However, culture-oriented e-Learning system is possible, in the sense that learners can have discussion, news, chat room and other functions in any language of their choice, probably when the right keywords are used. Nonetheless, community factors can be designed in any language when the developers put their minds to it and in consultation with learners. But the lack of culture within community factors can be regarded as lack of culture-oriented e-Learning on the side of the developers making the systems developer-oriented. There is advocacy of institutions and learners to be culture-oriented and prevent detached developers from doing otherwise. The more learners realise the benefits attached to the culture-oriented e-Learning system, the more developers will be compelled to do so.

INTDN01 an important participant believes that if a discussion forum take plan in the English language then it can happen in any other language. If for example, developers should "*consider discussion group for lecturers on the system, then, they would/most likely do it in Setswana*" and in another language. In as much as you use the right keyword in a system, there is nothing stopping you from engaging in discussion, announcement, news, and a bulletin in another language of your choice. However, it would be wise to "*write in a majority language where people (larger user) would understand you*"; be careful but contents can be in any language" (INTDN01).

Flexibility and usability (Customisation of the features, Challenges of customisation).

Usability: According to Recker and Niehaves (2008), usability helps to present meaningful IS contents to users. Their usability depends on the friendly content of the system and the possibility relies greatly on the incorporation of cultural features as seen in the objectives of this study. Also, to this study, usability means learning components that can be used multipurpose and in a multicultural context and participants worry more about system's usability than other things. INTDN02 argues that they "*discuss usability issues a lot*", because they "expect usability issues to reflect on cultural issues" of the system. But according to INTDN05, culture-oriented factors are important and achievable through system "*usability*".

System usability is key to participants who declare that usability should be included among the cultural factors and also during the development of the e-Learning system. The integration will promote efficiency, productivity and formulation of culture-oriented e-Learning framework.

However, usability aligns with home language and one official language (English), the quality of the system, and the technical knowledge of the administrators. Overall, the majority of the participants believe that it is important to have everything (e-Learning system) in the learners' home language in an effort to boost system usability.

Conclusively, the impact of culture and its execution is felt in e-Learning system usability. INTDN02 believes that "*the most important influence is created in the usability of the system because students can understand the workability of the software/system*". In general, participants suggest that through usability cultural factors can be established in e-Learning framework and implementation. The participants' suggestions are was backed by literature. The acceptability of e-Learning in cultural settings largely depends on usability (Carabaneanu et al. 2006). To this point, participants can confirm the importance of usability by saying, "*we do not assure cultural factors but the concept of usability and good design is important*" to us (INTDN02). To implement e-Learning system which is culturally incorporated, participants are more concerned with usability, what the system can help users to achieve and the system users themselves than any other thing. Nonetheless, according to INTDN02, in achieving usability, symbols and icons that are relatively common with the users must be used.

Flexibility: E-Learning software tools should provide flexible guide and instruction (Oye et al., 2012). Any framework to be developed must be flexible enough to explore features, customs, traditions, values, attitudes, symbols that define learners' approach to learning conditions (Bracken, 2010). In backing these ideas, participants regard the system flexibility as an important area that will please learners. As a matter of importance, developers felt that learners "*appreciate flexibility especially on the timing of accessibility*" as noted by one of them (INTDN02), though this flexibility can be challenging and difficult to manage in the execution of e-Learning system. Also, for participants, the flexibility of e-Learning tools and features allows for the introduction of personal learning style into the system in order to provide comfort for learners.

However, the current lack of flexibility from the fact that the e-Learning system is conventionally developed with English content at the heart of the development as seen in SA and this makes it rigid against other cultures (language). Understanding the possible cause of this lack of culture-oriented e-Learning is important, however, participants' views really indicate lack of flexibility in the e-Learning system during and post-development as the main

cause of the lack of a culture-orientation system and which has hindered proper execution of the system.

But, through the integration of this cultural element in the learning material, other elements and components can easily be captured during the development of e-Learning system by the help of e-LSDF. However, System Development Methodology (SDM) is the platform that can be used to present these elements, components and factors. But participants seem to be focused primarily on flexibility because it caters for a wider range and allows learners to go at the level to which they can comprehend the learning document. At this level, INTDN03 suggests the inclusion of different aspects of learners "*language but not all of them*" in the development of a culture-oriented e-Learning system.

5.2.3.10. System Development Methodology (SDM)

SDM can be seen as the backbone in developing quality information system including e-Learning systems. This section tries to comprehend the kind of SDM used by participants in achieving the e-Learning system. The following are noted from the analysis as there are different forms of methodologies used by developers in the development:

Agile approach and Scrum

The Agile approach is an innovative methodology that facilitates the development of Information Systems (IS) with a lot of benefits attached (see Chapter two above). Participants agree that they follow an Agile methodology to implement and develop the e-Learning system according to the specifications of the learners and the system. In support of this, INTDN02 states that they "*follow more on Agile approach*" and INTDN05 uses the methodology to analyse, plan, "implement and execute specifications".

While scrum development methodologies is a form of Agile approach used in addressing complex problems and challenges in order to produce good quality software within competitive time by a small team of developers, INTDN03 views the methodology as a much better approach used in the development of e-Learning system as the same can be suitable for culture-oriented e-Learning system. Also, according to INTDN04, "*agile methodology is used to implement and develop the users and system specifications*". As said earlier, the full discussion on Agile and Scrum is found in chapter two.

Waterfall model

Waterfall model is a step-by-step development procedure used in the design and implementation of information systems including culture-oriented e-Learning system. In support for this methodology, INTDN03 believes in waterfall as a better methodology than what they used in the development.

Togaf framework

Togaf framework is used in the development and determination of learner needs and expectation during the development process. According to INTDN04, in IT development, "*we use the Togaf framework to determine needs*" and understand systems and users requirement in the development process. The discussion continues on Analysis, Design, Development, Implementation, and Evaluation (ADDIE).

ADDIE

On the other hand, the ADDIE model is used in the development of the e-Learning system whether the conventional or culture-oriented system. Nonetheless, another participant mentioned **ADDIE** as a used framework. Along the line of the interview, a participant was asked about factors to include in the culture-oriented system and it was noted that ADDIE framework was an ideal factor to consider in the development process. According to INTDN05, "*within the ADDIE framework, considering culture (the ethnicity, religion, gender, and socioeconomic background) of your students will assist you to understand the nature of the problem you are trying to solve*", and it is a selected and suitable framework to consider as a methodology in the process.

However, a detailed discussion of this framework is also found in chapter two of this study. This proves that participants in this study select listed methodologies in the development and implementation of e-Learning, however, these methodologies can be used in capturing the culture in the development. The selection and usage of these methodologies and framework are based on the developer's wealth of experience.

Experience (medium or less experience)

Participants' wealth of experience and skills in SDM were tested at this level and, according to INTDN03, "*they are very experienced (well experienced)*" in their chosen methodology and framework. In another words, the experience of the participants can be viewed as excellent in

usage and the implementation process. This means that participants have good knowledge of these methodologies they used in the development of e-Learning.

There is the need for the researcher to determine how participants select SDM in the development of e-Learning. Participants' expression shows that they select suitable methodology through the support of Academic Support Centres (ASC) across their institutions while few have no idea about the selection process. Suitable SDM is also selected specially through consultation with clients through survey and interview: the approach aims to get feedback from learners. Participants also engage in interaction with other universities in building collaboration which can result in a quality system development. The discussion moves over to general problems and challenges faced in the development or customisation of culture-oriented e-Learning system and any other system.

5.2.3.11. The problems encountered in the development or customisation of the e-Learning system.

The challenges and problems encountered in the development of e-Learning system relate to causes, technology and possible solution.

Cause of the problems

As a popular saying goes, 'no smoke without fire'. There is an indication that e-Learning development challenges are attributed to different factors. To a large extent stage, the cause of e-Learning system problem can be attributed to an increasing usability rate as noted by INTDN02 who said: "*the use of e-Learning is increasing and people want more and more*". At the usage level, it leads to the cause whereby developers are faced with a lot of requirements and expectations from the users and the system itself. The following are identified as the possible problems:

Increase in the e-Learning usage

The finding revealed that the use of e-Learning is increasing which adds to the challenges in managing the development and customisation process of the e-Learning system. The high increasing rate surely demands that education institutions build more integrative and supplicated systems to cope with the challenges.

The increased usage of the e-Learning system is among the proposed solution to curb the challenges. Also, a participant stressed the point that education institutions need to invest more

resources in equipping staff and budgeting that will improve development and increase content quality.

Technology

In the e-Learning system, whether a conventional or culture-oriented system, they all run on technology. The technology is used by developers, teachers, learners and administrators alike.

Use of technology

The use of technology brought about innovation in education and society at large (Niculescu-Aron 2007). These innovations in technology affect learners' acceptability and demand resources, time and skills. The base of the effect and impact upon, participants think in this line of thought by believing that "*it's a good thing that everyone to use the technology and also a great advantage to learn perfectly or improve on another language (English)"* (INTDN01). Technological innovations are challenged because some cultures may not allow the use of certain types of technology (e-Learning system) and that is a major challenge.

The use of technology has been affected negatively with the reason that "*the university decides on the choice of the technology to be used and the teachers basically decide what part or culture that should be included in the system based on students expected*" (INTDN02). Another participant said: "*people are still afraid to use technology*" (INTDN04). This fear also relates to change adoption which negatively impact upon the implementation of the e-Learning process.

Technological adoption

Technological adoption into the culture-oriented e-Learning platform is generally challenging but influential. The level of innovation is seen in today's e-Learning world as challenging for universities and learners to cope with their continual changes in relation with the culture-oriented e-Learning platform.

The e-Learning system is also challenged on the changing technological gadgets nowadays because customisation in any e-Learning system is one thing but to maintain the customised system is another thing. It requires a lot of work and it is also expensive to implement customisation because whenever the system changes one needs to implement the change all over again. According to a statement by INTDN02, "*one major challenge though would be the use of technology or its acceptance and adoption because some cultures may not allow the use*

of certain technology (e-Learning system) and that is a major challenge". INTDN03 also believes that technology adoption "*continually changes and technology brings a lot of demand on deliverables*". These changes negatively impact upon and affect the overall, as INTDN04 says, "*there is the fear of change that can be negative in the implementation of e-Learning*". But there are solutions initiated.

Possible solutions

Against the challenges facing e-Learning together with a culture-oriented e-Learning system, developers demand solutions in handling such challenges. Participants were asked to voice out their opinion on the possible solution to confront the challenges. Among the opinions are co-operation among developers and the establishment of support centres in the institutions that will provide assistance with an improvement on infrastructure.

An increase in the e-Learning system usage brings a solution to e-Learning challenges and will be facilitated by fast development. The faster the development, the more adaptive the system can be innovative and determine constant changes that learners need. This section takes us to the understanding in order to whether institutions are developing any culture-oriented e-Learning system. The following are noted as the solutions:

Interaction with other universities

The developers' interaction with other universities is among the solutions proposed by participants. On participants contact and consultation with other institutions in the selection of development methodologies, here is how INTDN02 puts it, "*our practice involves interventions with other universities around the world*" in order to deliver quality e-Learning system. Then, universities ought to build systems that can integrate with other universities in process and implementation.

Add resources

There are many resources that are considered while developing e-Learning system, then, according to INTDN02, "*universities should put more resources to e-Learning in-terms of staffs and budget*" as a major means to tackle problems and challenges encountered in the development of e-Learning system. Also, INTDN03 acknowledged that "*adequate funding (money)*" should be made available in the execution of any e-Learning project.

Clear objectives and deliverables requirements

In tackling the challenges confronting e-Learning system development, there is a need for the developers together with other stakeholders to define and outline clear objective of the system. In support to this, INTDN03 suggest that the solution to the problem is to outline achievable objectives and the "*deliverable should be outlined from the beginning*" of the development plan.

5.2.3.12. The future of e-Learning system in our society

The effort of today shapes the future. Then, this is the last section of the description but not the least section on the study. The section aimed and seeks to understand from the participants on the future of e-Learning system in our society. Participants confirmed that the future is huge, promising and advantage to the users and should be encouraged in the country. The following categories were noted:

Increase the learning presence

The huge impact upon e-Learning system in future makes it increasingly in the learning environment. Learners can comfortably use their technological gadget and engage in learning process at their convenience. According to (INTDN01), "*the future of e-Learning system is huge. It would grow and keep growing. The more people are connected the more skilled they become in the e-environment. I think it has huge advantages for people and also, I think in our country, we need to teach e-Learning to our learners. I mean a sphere of education in the country*". The future is promising because it brought flexibility outside the formal learning environment of the university, then; participants strongly suggest that it's promising. The increasing rate result that everyone can use the technology and also a great advantage to learn perfectly or improve on another language.

In general, the researcher can positively say that the future of culture-oriented e-Learning platform is real and promising due to a huge amount of advantages and benefits attached to it. Then, e-Learning system is a place for the future. The said future is better on the integration of culture-oriented into e-Learning system that seeks to accommodate learners across cultural affiliation.

Promising and bright (not bright)

This section seeks to determine the future of e-Learning in our society. In accordance with INTDN03, "*the future is bright, I think in few years' time e-Learning system will be open even*

to primary and secondary at the lower age". While according to INTDN04, "*e-Learning is becoming more and more important as distance learning become a reality*". To this point, the study can confirm that e-Learning system and culture-oriented e-Learning is gaining more popular as a result high technological penetration and usage, however, these dreams can be profitable with more investment. Again, the productivity and prosperity of e-Learning system should be encouraged and taught from an early age, this is how INTDN03 suggested it "*I think this cultural e-Learning system should be encouraged at a younger age while people are still in primary schools so that they can be able to grow up with it and adapt. But in higher education, it will be difficult*". Early age implementation will produce a greater outcome.

Outcome

Understanding the effect of e-Learning usage on output is paramount. This section of the discussion aimed to achieve such in line with the understanding ways cultural differences impact upon the design of e-Learning system. According to Al-Tarawneh (2012), culture and its attributes impact upon and reshape societal value and determine how individuals and organisations think, feel, behave, interact and engage. However, culture as a fact has an input; you get influenced by the knowledge of the e-environment. The future of e-Learning system increases quality output in teaching and learning performance and learner's throughput. But, these elements and factors discussed above face challenges but there are handled by the implementation of e-LSDF.

Quality outcome

E-Learning is developed with the idea to add value and improve ways in teaching and learning. Base on this, the most important thing is that users of the e-Learning system are adequately considered in terms of their usability and the system outcome. The learning outcome is proved on the learners learning improvement. Participant's concord is that the most important factor to consider while developing e-Learning system is the outcome because one needs to understand the added value of the system been develop and used.

Lack of infrastructure and equipment

The infrastructures used in the implementation and usage of e-Learning system remain challenging as a result of limited resources. Participants were asked whether culture affects the outcome of e-Learning development and usage in SA education. But, participants (like INTDN03) believed that "*lack of infrastructure and equipment in SA*" hampers the e-Learning

system future because there are not well establish an infrastructure to accommodate e-Learning system most especially culture-oriented e-Learning system. Also, there are "*problem with the Internet*" connections across learning institution and high the cost of Internet tariff at homes.

In addition, "*e-Learning materials or equipment are very expensive*" (INTDN03) which directly affect the overall outcome and development. The effect can be regarded as a challenge. Nonetheless, according to INTDN04, the "*biggest drawback, on IT side, for establishing e-Learning in SA is the fact that infrastructures in SA are limited and very expensive*" compared with the rest of the world.

5.3. CHAPTER SUMMARY

The core objective of this chapter was in order to present, analyse and discuss the themes generated from the open coding (qualitative interview data). The chapter provided a detailed discussion of the themes in line with existing literature. The alignment with research design and methodology indicates the procedure outlined in the chapter and which followed the analysis and discussion in line with nested mixed methods. Moreover, the alignment with the original literature aimed to support the primary information collected from the participants. A total of 236 quotations relating to 50 themes were openly coded from the individual interview transcription. As a mixed methods research, these qualitative themes paired with quantitative (questionnaire) findings in order to validate cultural dimensions and factors relevant for the execution of e-LSDF that provides a solution to e-Learning challenges as identified in the problem statement (see chapter one). The chapter used nested mixed research design to reach the findings presented here.

In conclusion, this chapter has managed to determine the factors, elements and components that impact upon positively and negatively towards the adoption of a culture-oriented e-Learning system in practice. These findings speak to the needs and expectations of the learners. The outcomes further realised the need for developers to create a generic learning system which is more culture-oriented, because the existing system lacks cultural factors and focuses more on developers and lecturers. The e-Learning system is generally challenged on technological adoption (integration) and resource constraints. The chapter also realises the lack of learner involvement (consultation) in the design, while observing that the system has obvious orientation towards developers and lecturers. The findings also show lack of culture consideration in the design and customisation of e-Learning system by education institutions as noted by NWU, Wits and UCT. Again the system lacks diversified learning styles and

flexibility which participants are proposing for inclusion because such features would enhance usability, quality design plan, language, symbols and icons in the design process.

Achieving these elements and factors in the design is facilitated by the efforts of academic support centres, lecturers, cultural factors, infrastructures, managing resources, technologies, developers, teachers, learners, system customisation, usability and usability and SDM. All these put together would eventually assist in the execution of an effective culture-oriented e-Learning system that suits learners across all cultural backgrounds. In sum, participants believe that culture-oriented e-Learning system is achievable against all the challenges and disadvantages. This chapter concludes that the research design and methodology procedure achieved the mandate of the chapter through the interview aspect of the study.

As an MMR, the next chapter provides the systematic detail of the presentation and analysis of the quantitative results to further support the qualitative findings from the perspective of the users of the system. The empirical results are shown in charts, tables, through descriptive statistics, correlations and chi-square.

CHAPTER SIX

QUANTITATIVE ANALYSIS AND DISCUSSION OF FINDINGS

6.1. INTRODUCTION

The previous chapter covered qualitative data analysis together with the presentation and discussion of the first part of MMR. This chapter, the second stage of the MMR of this study, presents data obtained from the quantitative study using descriptive data analysis, correlation and chi-square in addressing a culture-oriented e-Learning System Development Framework (e-LSDF) in higher education institutions.

In an attempt to achieve effective analysis and presentation, the SAS, SPSS and Microsoft Excel application software were used. Tables and figures were used to group the frequency distribution figures of the respondents' views and ideas (see Annexure O and Annexure P). The main purpose of the questionnaire in order to obtain data from the learners to support the interview data as a mixed research method in building culture-oriented e-Learning System Development Framework (e-LSDF) in higher education institutions. Most importantly, correlation and chi-square were deployed to determine the relationship between two variables with regard to the overall objective of the research.

This study also deployed the research design known as nested mixed methods to accomplish the mixed data analysis. The entire quantitative sample population size of 74,355 registered learners (students) in 2015 (nwu.ac.za) and 728 questionnaires were collected and analysed. The chapter is arranged in the following manner: the presentation of the descriptive statistics and frequencies; the correlation, chi-square analysis and discussion of quantitative findings.

6.2. DESCRIPTIVE STATISTICS AND FREQUENCIES

The descriptive statistics and frequencies are done according to the structure of the questionnaire in this study (see Annexure B). The bar charts and tables present participants' responses in percentages to contribute to the culture-oriented e-Learning System Development Framework (e-LSDF) in higher education institutions. The questionnaire is divided into the following segments:

- ✓ SECTION A: Personal particulars

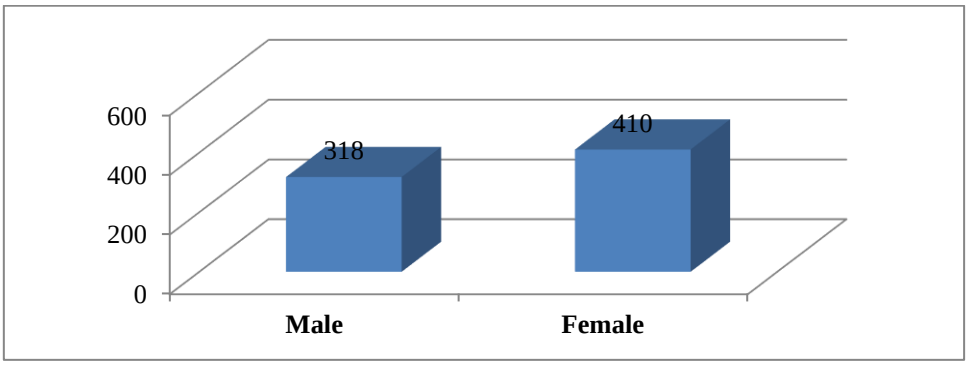
- ✓ SECTION B: Challenges facing the current e-Learning system
- ✓ SECTION C: Culturally-oriented e-Learning to serve learners.

The descriptive statistics process began with Section A of the questionnaire and the full discussion on the descriptive statistics is done in section 6.6 below.

6.2.1. SECTION A: Personal particulars

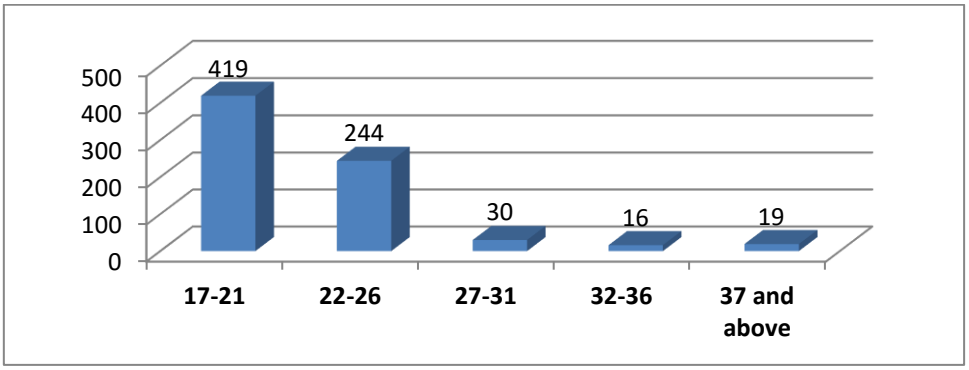
The biographic question starting with Figures 6.1 and ending with 6.7 is a reflection of the respondents' particulars as shown below. The table shows data presentation from the standpoint of the participants followed by summaries.

Figure 6.1: Gender



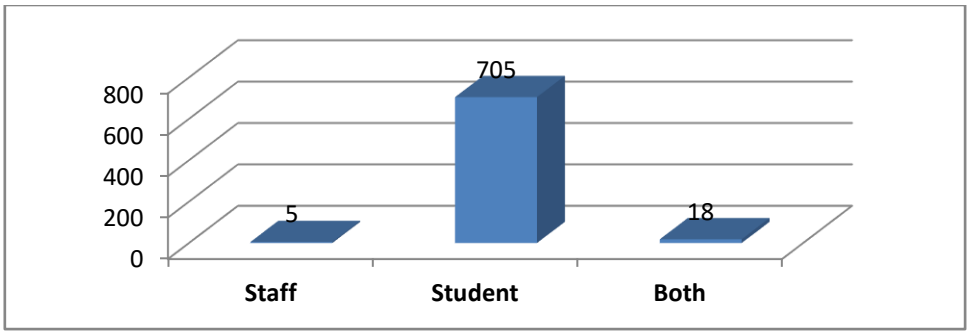
The details in Figure 6.1 indicate that 43.68% of the respondents are male students while 56.32% are female. Female respondents make up the majority in this study.

Figure 6.2: Age group



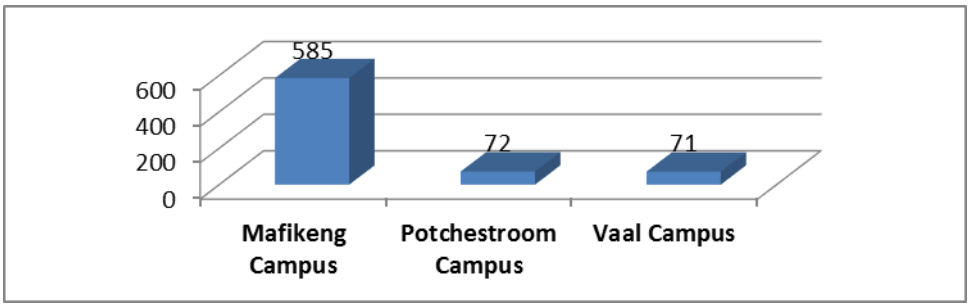
The above chart indicates respondents' age group which shows that 57.55% of the respondents are aged between 17-21 while 33.52% of the respondents are between 22 and 26 years and 32-36 age group constitutes 2.20%. The findings show that majority of the respondents are young and technologically-minded students.

Figure 6.3: Status



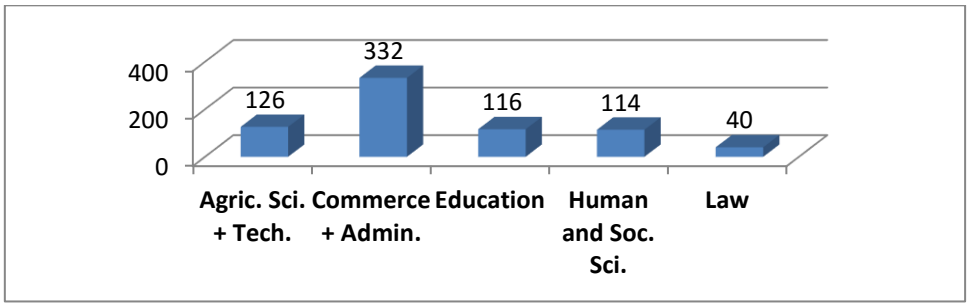
This question determined the status of the respondents in this study. The findings show that 0.69% are staff, 96.84% are students while 2.47% were in the category student-staff. It shows that most of the participants are students.

Figure 6.4: Campus



From the campuses above, the question aimed to determine the campus from which learners are enrolled: Mafikeng showed 80.36% response rate, Potchefstroom 9.89% and Vaal presents 9.75%, indicating that most of the respondents are enrolled at the Mafikeng campus.

Figure 6.5: Faculty



As far as faculties are concerned, Agriculture, Science and Technology (FAST) show 17.31% (126) response rate, Commerce and Administration 45.60% (332), while 5.49% (40) respondents were from Law. Overall, more learners in this study are from the Commerce faculty.

Figure 6.6: Academic level

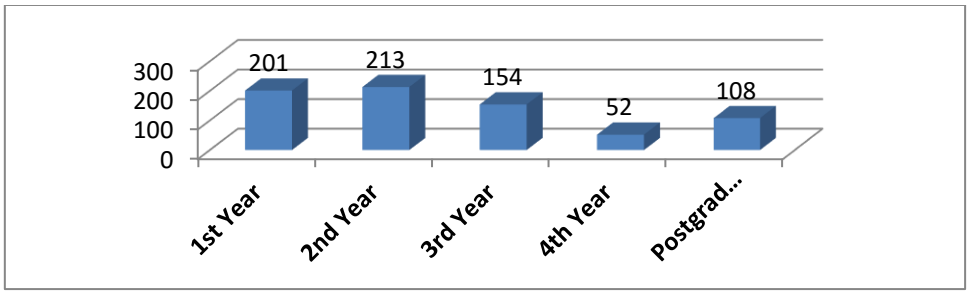
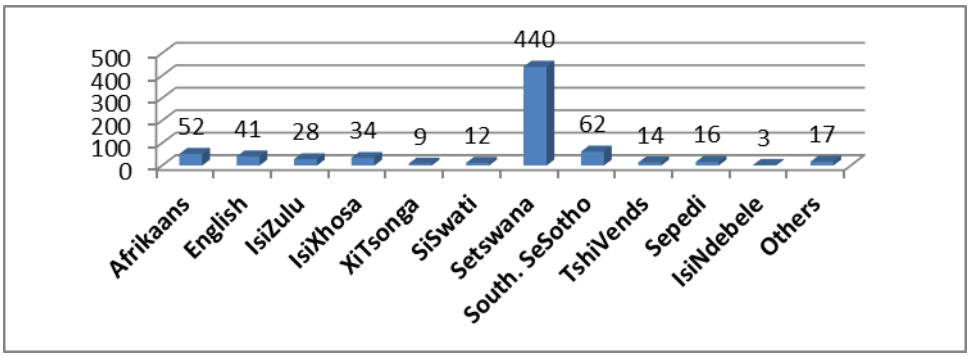


Figure 6.6 above depicts the different academic levels of the learners. From the academic point of view, 29.26% of respondents are 2nd-year students, 27.61% are 1st years and 7.14% are 4th year learners.

Figure 6.7: Home language (A7)



With regard to home language, 7.14% of the respondents are Afrikaans speaking, 60.44% are Setswana speaking while 0.41% are speakers of isiNdebele. The question tried to ascertain the home language of the participants and the results show that most of the students speak Setswana.

6.2.2. SECTION B: Challenges facing the current e-Learning system

The questions in Annexure O aimed at understanding the challenges confronting users of the e-Learning system which affect their overall usage and hinder the potential benefits attached to it. To recall section 4.6.3 in Chapter four (Annexure C), some of the questions are rearranged into single and multiple answer options, the singles ask participants' selection of individual question options (like campus) while the multiple options ask the participant's selection (collection) of question options more than one (like participants selecting on campus and off campus). However, some of the questions in Annexure O and Annexure P are arranged between single and multiple options, the rationale behind the single (cell phone) and multiple options (cell phone, desktop, iPad and laptop) is to minimise the large scale of responses and also to

make the presentation more understandable. The interpretation of the table in Annexure O content is done after the table and the full discussion of the question follows in section 6.6.

According to Annexure O below, learners were asked about access location; the results show that 99.04% of the respondents got access to e-Learning platforms across single location (on campus or off campus) while 0.96% had access from multiple locations. On the frequency of access to e-Learning, 90.52% of the respondents accessed e-Learning often from a single location while 9.48% of the access was from multiple locations. Again, learners were asked about their method of accessing e-learning system and 81.32% of the respondents used the single gadget and 18.68% used multiple gadgets (see Annexure B). These imply that learners usually use single gadget to access a generic e-Learning system that allows them to engage in the learning using different platforms.

The participants were asked if they had attended learning classes purely done on e-Learning platforms. The results indicated that 31.32% of the participants chose yes, 51.51% responded no while 17.17% respondents were not sure if they had attended a class were e-learning system was only used. The question on the use of e-Learning in any modules was asked, the response showed that 86.13% of the participants had used e-learning in they modules while 6.59% responded no and 7.28% were not sure on the question. The indication of the mode of communication with lecturer showed that 70.60% of the respondents used single channel (like eFundi, email, face-to-face or phone call) in communicating with the lecturer and 29.40% used multiple channels (all the channels listed) to communicate with the lecturer. Learners were also asked whether they prefer e-Learning designed in home language and 27.88% indicated seeing e-Learning system designed in their home language, 58.38% indicated the opposite while 13.74% were not sure on the preferred language of design.

Participants were also asked on the preferred language of e-Learning and 60.44% preferred English while 31.18% of the respondents indicated both (English and Home language). To determine whether participants preferred e-Learning over classroom teaching, the outcome was that 25.27% were not sure on the preferred platform while 53.43% did not prefer e-Learning platform over the classroom. Again, the researcher asked participants about the current e-Learning features they used most. The result was that 41.48% of the entire respondents used the single feature (like slides/resources) and 58.52% multiple features (slides/resources, check announcement, forums/message, upload documents (assignments), answer online quizzes/tests/exams, homework/projects/presentations and group work discussions). Again,

the researcher aimed to determine if learners were able to customise e-Learning to home language and the result showed that 44.09% responded that they could not customise e-Learning features to their home language, 35.03% were not sure but 20.88% could customise to their home language. In trying to understand whether participants had been consulted by e-Learning developers during the development process, 80.91% of the respondents had not been consulted by developers and 13.46% were not sure if they had been consulted. A question was asked whether the institution encouraged participants to use the e-Learning system and 86.26% of the respondents indicated having received encouragement from the institution while 9.48% of the respondents had not received the encouragement.

A question was asked to determine from the participants their perception of the state of e-Learning system they use and 81.87% (B14) of the participants regarded the current e-Learning system as effective while 10.71% saw it as problematic and difficult. On e-Learning challenges compared to the classroom challenges, 97.80% had mixed feelings (single issue) on the challenges compared to those encountered in the classroom while only 2.20% responded multiple issues. Furthermore, to ascertain the benefits of the e-Learning system in relation to participants' studies and learning style, 82.97% responded agree/strongly agree on the benefits, 15.38% of the respondents disagree/strongly disagree, while 1.65% of the indicated that they were not sure of the benefits attached to the e-Learning system.

In determining the part of the cultural element that influences their usage of e-Learning system, 81.87% of the respondents are influenced by single element (the selection of any of these elements: religion, values and attributes, language, law and politics, beliefs, communication, symbols, power or customs and traditions) while 18.13% by multiple elements, the combination of religion, values and attributes, language, law and politics, beliefs, communication, symbols, power and customs and traditions. At this level, the researcher proceeded to determine the cultural impact upon e-Learning, to which 44.64% of the respondents believed that culture would have an impact upon and improve their level of understanding of the content, 43.13% of the respondents felt no there would be no influence while 5.22% believed that cultural elements would help them to think in more focused ways.

6.2.3. SECTION C: Culturally-oriented e-Learning to assist learners better

The alignment of e-Learning with learners' cultures remains challenging and the questionnaire in Annexure P sought to understand from learners how their cultures could be represented or

captured on the e-Learning system. The table is tagged “The implementation of culture-oriented e-Learning” (Annexure P). The full discussion on the question is done in section 6.6.

The analysis begins with the first question which sought to find out whether participants find e-Learning system easy to use (C19). The finding is that 90.38% of the respondents find e-Learning easy to use while 8.52% disagree/strongly disagree on the easy usability of the e-Learning system.

The next question identified technical problems experienced while using e-Learning and the finding shows that 60.58% of the respondents have experienced technical challenges while 35.03% of the respondents have not experienced any form of challenge. In trying to understand whether e-Learning teaching support would make participants attend teaching and learning classes frequently, the research discovered that 52.20% of the sample felt that e-Learning system would assist them to attend classes more often, whereas 42.17% of the respondents felt the opposite. From a subsequent question, participants were asked whether the e-Learning forum supported and encouraged them in their studies and the finding shows that 73.49% of all the sample agree/strongly agree with the support and encouragement they received via the e-Learning system while 25.41% responded the other way around.

In order to understand if e-Learning supports learners more on their core modules, the finding from the question indicates that 76.10% of the respondents received more support from the e-Learning system while 21.84% responded otherwise. On the question to determine whether the current e-Learning promotes and provides learners with favourable learning experiences, 78.16% responded positively that learning experiences promoted e-Learning system while 20.88% of the respondents saw no positive learning experience from the e-Learning system. On the issues confronting e-Learning systems, 94.51% of the sample responded on a single issue (like lack of cultural elements, unfriendly to use, lack of user’s knowledge or not sure) while 5.49% preferred multiple issues (as listed earlier). On the question of course delivery through e-Learning in future, the question aimed to understand whether learners expect to have more modules delivered via e-learning system in future, 60.71% of the respondents agree/strongly agree while 31.18% disagree/strongly disagree on the question.

With regard to the degree to which learners think cultural factors have an impact upon on e-Learning: the findings show 32.55% of the population said yes, 26.24% responded somewhat while 15.93% selected not at all. Learners were also asked if they thought community factors could help shape learning capacity and 65.11% of the population said yes, 22.94% chose

somewhat while 5.49% selected not at all. A question was asked whether learners thought administrative factors should be considered in e-Learning design and the response was 73.49% of the population believed these administrative factors ought to be addressed, 17.86% were somewhat, and 3.02% selected not at all. On the content factors being important to students in e-Learning, 80.22% of the respondents chose yes, 14.15% responded somewhat and 2.75% chose not at all. On the question of learning style assisting students to focus on e-Learning or learning processes, 67.45% agreed that learning style assists them to remain focused in the learning environment, 23.21% chose somewhat while 3.30% chose not at all.

Learners were also asked whether lecturers assisted them on how to use e-Learning system. About 43.96% of the respondents indicated they had received partial assistance from the lecturers, 37.64% chose full assistance while 18.41% selected no assistance provided. With assistance from AEF to stay focused on e-Learning, 63.74% of the respondents selected yes, 27.06% chose somewhat while 3.71% chose not at all. The last question asked if learners thought that the listed factors were important to e-Learning system and the responses indicated that 65.38% of the respondents said yes to all the factors, 25.14% selected somewhat while 4.12% chose not sure. The next discussion is about correlation of the links among variables in adding value to this study, so that their strength could be ascertained.

6.3. THE CORRELATION

Correlation is a statistical way to determine whether or not there is a relationship between two variables (Higgins, 2005). In this research, correlation is applied to measure the coefficient and displays the strength, weakness or linear relationship between two variables. The relationship and association usually lie between +1 and -1. The level of significance is shown as p-value to determine the strength or weakness of the variables' relationship and the p-value is set at 0.01 (1%) in this study. Importantly, in this study the correlation focuses more on the p-value, when p-value is ≤ (less than or equal) to 0.01, then the correlation is significant and the reverse is insignificant. Establishing correlation involves establishing a correlation coefficient which guides in identifying the level of association among variables. The rationale for the correlation is that variables are related in this study and their level of dependence needed to be tested. Furthermore, in accordance with Pearson's correlation coefficient, the correlation range is shown in Table 6.1 (Higgins, 2005):

Table 6.1: The Pearson's correlation coefficient range (*adapted from Higgins, 2005*)

- 1 = Strong downhill	Negative
- 0.70 = Strong downhill	
- 0.50 = Moderate downhill	
- 0.30 = Weak downhill	
0 = No linear relationship	
0.30 = A weak uphill	Positive
0.50 = Moderate uphill	
0.70 = A strongly uphill	
1 = A perfect uphill	

P-value = 0.01 as indicated above. The research rejects null hypothesis H0 when the p-value is less than or equal to 0.01. This means the variable relationship is reliable and can be used to make predictions. Also, the data is significant at the 0.01 level and insignificant above the p-value.

This quantitative part of the study consists of two research questions as stated in Chapter one (second category). In an attempt to address the problems specified in Chapter one and the succeeding research objectives, correlations were calculated as seen in Annexure D to J, but only the highlighted variables in the correlation table in the Annexure D were considered in this study. Furthermore, the aim in order to understand the link and interactions between variables in the research questions and the research objectives in providing a pathway to resolving the articulated issues of the problem statement in Chapter one.

The presentation of the correlation was done in two ways: firstly, the full correlation tables among the variables were done (see Annexure D to J) and secondly, the following Tables 6.2, 6.3, 6.4, 6.5, 6.6, 6.7 and 6.8 were deduced from the first set of correlated variables (see Annexure D to J). This second set of tables was used in this study because the values are less than or equal to 0.01 (p-value) as shown in Table 6.1 and significant to the study. Tables 6.2 to 6.8 help to minimise the size of data presentation. These tables do not hamper the full purpose of the correlation in this study and the detailed discussions on all the correlation is done in section 6.6 below. The correlation begins with determining the relationship between variables in research question one.

6.3.1. Correlation analysis of question two in the questionnaire (section B)

This section of the chapter deals with the link between the variables found in the questions in section B of the questionnaire. With reference to Annexure (D), the Table 6.2 consists of the

variables meant to address section B of the questionnaire and contribute in resolving the overall research problem, while the discussion is done below in section 6.6. As mentioned earlier, (see Table 6.1), the researcher used p-value at 1% level of significance with variables between +/- 0.30 to +/- 1.00.

Table 6.2: The multivariate correlation of the challenges facing the current e-Learning system

Research Question	Correlation	P-value	Correlation	Level of Significance
A7/B7	0.12816	0.0005	Weak positive	Significant
A7/B13	- 0.10356	0.0052	Weak negative	Significant
A7/B18	- 0.11953	0.0012	Weak negative	Significant
B7/B8	- 0.12005	0.0012	Weak negative	Significant
B7/B9	0.13167	0.0004	Weak positive	Significant
B7/B11	0.17707	<.0001	Weak positive	Significant
B8/B9	0.13382	0.0003	Weak positive	Significant
B8/B13	0.06016	<.0001	Weak positive	Significant
B8/B14	0.11247	0.0024	Weak positive	Significant
B9/B13	0.25025	<.0001	Weak positive	Significant
B9/B14	0.15799	<.0001	Weak positive	Significant
B9/B18	0.11576	0.0018	Weak positive	Significant
B13/B14	0.39634	<.0001	Weak positive	Significant
B13/B17	0.20197	<.0001	Weak positive	Significant
B13/B18	0.13565	0.0002	Weak positive	Significant
B14/B17	0.09359	0.0115	Weak positive	Significant
B14/B18	0.09532	0.0101	Weak positive	Significant

**=significant at the 1% level.

As noted from the beginning (Section 6.3), correlation establishes the relationship between variables. The act of causation cannot be established through correlation but the level of a relationship among variables can be understood (McMillian & Schumacher, 2012). The significance of the variables is valuable for cluster predictions as a result of the correlation ranges between +/- (0.30 to 1.00) which show a weak uphill relationship (see Table 6.1). However, all correlations in Table 6.2 were significant at 1% in regard to the challenges facing the current e-Learning system. The challenges lie with the determination of the following:

- ✓ Learners' home language (A7) encourages the institution to use e-Learning (B13) and cultural impact upon e-Learning (B18);
- ✓ Learners prefer e-Learning designed in home language (B7), preferred language for e-Learning (B8), and preferred e-Learning over classroom (B9) and learners were able to customise e-Learning to home language (B11). In another way, the institution encourages the use of e-Learning (B13) and learners' perception about state of e-Learning (B14);

- ✓ Learners preferred e-Learning over classroom (B9), institution encourages learners to use eLearning (B13); learners' perceptions of the state of e-Learning (B14) and cultural impact upon eLearning (B18);
- ✓ Institution encourages the use e-Learning (B13) learners' perception of the state of e-Learning (B14), elements of cultural influence on e-Learning (B17) and cultural impact upon on eLearning (B18);
- ✓ Learners' perception of the state of e-Learning (B14); the elements of cultural influence on e-Learning (B17), and cultural impact upon e-Learning (B18).

6.3.2. Correlation analysis of question three in the questionnaire (section C)

This section of the correlation deals with how culture-oriented e-Learning could be implemented to assist learners better. The alignment of e-Learning with culture remains challenging. This question seeks to understand from learners how their cultures could be represented in the e-Learning platforms. The correlated variables check for significance in understanding how to implement culture-oriented e-Learning. As noted earlier (see Table 6.1), the researcher used p-value at 1% level of significance and the correlation range between +/- (0.30 to 1.00). The correlation range shows weak positive and negative and this is significant to the study. Table 6.3 below provides evidence on the correlated variables (see Annexure E) which address the research objective one while section 6.6 provide the discussion.

Table 6.3: The multivariate correlation of culture-oriented e-Learning can be implemented to serve learners

Research Question	Correlation	P-Value	Correlation	Level of Significance
C19/C20	0.20036	<.0001	Weak positive	Significant
C19/C21	0.13153	0.0004	Weak positive	Significant
C19/C22	0.30311	<.0001	Weak negative	Significant
C19/C24	0.26490	<.0001	Weak negative	Significant
C19/C25	0.10407	0.0049	Weak positive	Significant
C19/C26	0.12534	0.0007	Weak positive	Significant
C20/C21	0.09090	0.0141	Weak positive	Significant
C20/C22	0.16647	<.0001	Weak negative	Significant
C20/C24	0.20649	<.0001	Weak negative	Significant
C20/C26	0.09107	0.0140	Weak positive	Significant
C21/C22	0.21866	<.0001	Weak negative	Significant
C21/C24	0.15929	<.0001	Weak negative	Significant
C21/C26	0.15033	<.0001	Weak negative	Significant
C22/C24	0.39848	<.0001	Weak negative	Significant
C22/C26	0.13432	0.0003	Weak positive	Significant
C24/C26	0.11817	0.0014	Weak positive	Significant

**=significant at the 1% level.

To recall, at 1%, all correlations are significant (see Table 6.1), the group variables and correlations are important for predictions. The above correlation lies between +/- (0.30 to 1.00), and shows a weak uphill relationship (see Table 6.1 above). On the whole, implementing culture-oriented e-Learning to serve learners goes with the understanding whether:

- ✓ Learners find e-Learning easy to use (C19) with experienced technical problems using e-Learning (C20), e-Learning teaching supports students attend classes frequently (C21), e-Learning forum supports and encourages students' studies (C22), and current e-Learning promotes favourable learning experiences (C24). The issues about e-Learning (C25) and wanting to see course delivery through e-Learning in future (C26) apparently has no significance on the way the students perceived these with changing variables.

6.3.3. Correlation analysis of question two and three of the questionnaire (section B and C respectively)

The variables correlated aimed at determining the challenges facing the current e-Learning system and how to implement culture-oriented e-Learning to serve learners more efficiently (see Annexure F). The correlation gathered variables from questions one and two of the questionnaire and checked the significance of the variables. The researcher only used p-value at 1% and variables at the correlation range of +/- (0.30 to 1.00). The correlation range shows weak positive and negative correlation but significant to the study. Table 6.6 presents the correlated variables from grouped section B and C in answering the research objective one and check out the discussion on section 6.6 below.

Table 6.4: The multivariate correlation of question two and three

Research Question	Correlation	P-Value	Correlation	Level of Significance
B7/A7	0.12816	0.0005	Weak positive	Significant
B8/C19	0.13513	0.0003	Weak positive	Significant
B8/C25	0.11048	0.0028	Weak positive	Significant
B9/C19	0.19907	<.0001	Weak positive	Significant
B9/C20	0.09274	0.0123	Weak positive	Significant
B9/C22	0.17127	<.0001	Weak positive	Significant
B9/C24	0.12788	0.0005	Weak positive	Significant
B9/C25	0.20712	<.0001	Weak positive	Significant
B11/C19	0.09386	0.0113	Weak positive	Significant
B13/A7	- 0.10356	0.0052	Weak negative	Significant
B13/C19	0.31032	<.0001	Weak positive	Significant
B13/C22	0.22960	<.0001	Weak positive	Significant
B13/C24	0.18871	<.0001	Weak positive	Significant
B13/C25	0.19595	<.0001	Weak positive	Significant
B14/C19	0.31474	<.0001	Weak positive	Significant

B14/C20	0.14638	<.0001	Weak positive	Significant
B14/C22	0.22893	<.0001	Weak positive	Significant
B14/C24	0.32646	<.0001	Weak positive	Significant
B15/C20	0.12000	0.0012	Weak positive	Significant
B17/C25	0.21509	<.0001	Weak positive	Significant
B18/A7	- 0.11953	0.0012	Weak negative	Significant
B18/C21	0.11227	0.0024	Weak positive	Significant
B18/C24	0.09740	0.0085	Weak positive	Significant

**=significant at the 1% level.

To recall, at 1%, all the correlations are significant (see Table 6.1), however, Table 6.4 is the group variable correlation among question one and two done for predictions. The correlation ranges between +/- (0.30 to 1.00) which shows a weak uphill relationship (see Table 6.1). The correlation focuses on the challenges facing the current e-Learning system and how to implement culture-oriented e-Learning to serve learners. These variables correlation go with:

- ✓ Understanding whether learners prefer e-Learning designed in home language (B7) with learners' home language (A7);
- ✓ Learners' preferred language for e-Learning (B8) with students finding e-Learning easy to use (C19) and the issues about e-Learning (C25);
- ✓ Learners preferred e-Learning over classroom (B9) with learners finding e-Learning easy to use (C19); experienced technical problems using e-Learning (C20), e-Learning forum supporting and encouraging students' studies (C22); current e-Learning promoting favourable learning experiences (C24) and the issues about e-Learning (C25);
- ✓ Learners being able to customise e-Learning to home language (B11) with I find e-Learning easy to use (C19);
- ✓ Understanding whether the institution encourages learners to use e-Learning (B13) with learners' home language (A7), students finding e-Learning easy to use (C19), e-Learning forum supporting and encouraging students' studies (C22), current e-Learning promoting favourable learning experience (C24) and the issues about e-Learning (C25),
- ✓ Learners' perceptions about state of e-Learning (B14) with students finding e-Learning easy to use (C19), experienced technical problems using e-Learning (C20), e-Learning forum supporting and encouraging students' studies (C22) and current e-Learning promoting favourable learning experiences (C24),
- ✓ E-Learning challenges compared to a classroom (B15) with experienced technical problems using e-Learning (C20);

- ✓ Determining elements of cultural influence on e-Learning (B17), with the issues about e-Learning (C25);
- ✓ The cultural impact upon on e-Learning (B18) with learners' home language (A7), e-Learning teaching supports will make me attend classes frequently (C21) and current e-Learning promotes favourable learning experience (C24).

6.3.4. Correlation analysis of question three in the questionnaire (section C)

How can culture-oriented e-Learning be implemented to assist learners better? (see Annexure G). The alignment of e-Learning with culture remains challenging. This question sought to understand from learners how their cultures could be represented on the e-Learning system. The variables correlated for significance to understand how to implement culture-oriented e-Learning. The researcher only used p-value at 1% and variables at the correlation range of +/- (0.30 to 1.00), the correlation range shows weak positive but significant (see Table 6.1). The correlated variables in Table 6.5 aimed to address the research objective two (2).

Table 6.5: The multivariate correlation of culture-oriented e-Learning could be implemented to serve learners

Research Question	Correlation	P-Value	Correlation	Level of Significance
C23/C27	0.13144	0.0004	Weak positive	Significant
C23/C28	0.14736	<.0001	Weak positive	Significant
C23/C29	0.10678	0.0039	Weak positive	Significant
C23/C31	0.14226	0.0001	Weak positive	Significant
C23/C32	0.15945	<.0001	Weak positive	Significant
C23/C33	0.15930	<.0001	Weak positive	Significant
C27/C28	0.20702	<.0001	Weak positive	Significant
C27/C33	0.12389	0.0008	Weak positive	Significant
C27/C34	0.21098	<.0001	Weak positive	Significant
C28/C29	0.23207	<.0001	Weak positive	Significant
C28/C30	0.24469	<.0001	Weak positive	Significant
C28/C31	0.25336	<.0001	Weak positive	Significant
C28/C32	0.10113	0.0063	Weak positive	Significant
C28/C33	0.26231	<.0001	Weak positive	Significant
C28/C34	0.26967	<.0001	Weak positive	Significant
C29/C30	0.31472	<.0001	Weak positive	Significant
C29/C31	0.26667	<.0001	Weak positive	Significant
C29/C33	0.21583	<.0001	Weak positive	Significant
C29/C34	0.21358	<.0001	Weak positive	Significant
C30/C31	0.33704	<.0001	Weak positive	Significant
C30/C33	0.24355	<.0001	Weak positive	Significant
C30/C34	0.21014	<.0001	Weak positive	Significant
C31/C32	0.12595	0.0007	Weak positive	Significant
C31/C33	0.33058	<.0001	Weak positive	Significant
C31/C34	0.21514	<.0001	Weak positive	Significant

C32/C33	0.20682	<.0001	Weak positive	Significant
C32/C34	0.15650	<.0001	Weak positive	Significant
C33/C34	0.36946	<.0001	Weak positive	Significant

**=significant at the 1% level.

As a reminder (see Table 6.1), all the correlations are significant at 1% p-value; however, Table 6.5 is the group variables correlations for question two (How can culture-oriented e-Learning be implemented to serve learners?) for the purpose of predictions. The correlation ranges lie between +/- (0.30 to 1.00) which shows a weak uphill relationship (see Table 6.1) and section 6.6 provides the discussion. However, question two focused on how culture-oriented e-Learning could be implemented to serve learners. The implementation processes lie with:

- ✓ E-Learning support is more important in major modules (C23) with learners thinking cultural factors have an impact upon e-Learning (C27), thinking community factors could help shape learning capacity (C28), thinking administration factors be considered in eLearning design (C29), does learning style assist students to focus more (C31), and do lecturers assist learners on how to use e-Learning (C32), and does AEF assist learners to stay focused on e-Learning field (C33);
- ✓ Issues about e-Learning (C25) with learners' home language (A7);
- ✓ Thinking cultural factors have an impact upon e-Learning (C27) correlated with AEF assisting learners to stay focused on e-Learning field? (C33) and think above-listed factors are important to eLearning system (C34);
- ✓ Thinking community factors can help shape learning capacity (C28) correlated with thinking administrative factors be considered in e-Learning design (C29), thinking content factors are important to students on e-Learning? (C30), does learning style assist students to focus more (C31), do lecturers assist learners on how to use e-Learning (C32), does AEF assist learners to stay focused on e-Learning field (C33) and think above-listed factors are important to the e-Learning system (C34);
- ✓ Understanding whether learners think admin. factors be considered in e-Learning design (C29) with think content factors are important to students on e-Learning (C30), does learning style assist students to focus more (C31), does AEF assist learners to staying focused on e-Learning field (C33) and think above-listed factors are important to e-Learning system (C34);
- ✓ Determining whether learners think content factors are important to students on e-Learning? (C30) with does learning style assists students to focus (C31), does AEF assist

learners to staying focused on e-Learning field (C33) and think above-listed factors are important to the e-Learning system (C34);

- ✓ Does learning style assist students to focus (C31) correlated with lecturers assisting students on how to use eLearning? (C32), does AEF assist you to stay focused on e-Learning field (C33) and think above-listed factors are important to e-Learning system (C34).

6.3.5. Correlation analysis of question two in the questionnaire (section B)

The correlated variables in this section deal with the challenges facing the current e-Learning system for the study. Decisively, the correlated variables could be used in addressing Objective four (4) (developing e-LSDF e-Learning framework that would be suitable in different cultural e-Learning environments in SA). In addition, the majority of the variables in Table 6.6 are from the questionnaire section B (see Annexure H) with the mandate to address the overall research problem statement, while the full discussion is provided in section 6.6 below. As noted (see Table 6.1), the researcher used p-value at 1% level of significance with correlation range which lies between +/- (0.30 to 1.00) (see Table 6.1).

Table 6.6: The multivariate correlation of the challenges facing the current e-Learning system

Research Question	Correlation	P-Value	Correlation	Level of Significance
A7/B7	0.12816	0.0005	Weak positive	Significant
B7/B8	- 0.12005	0.0012	Weak negative	Significant
B7/B11	0.17707	<.0001	Weak positive	Significant

**=significant at the 1% level.

As a reminder (see Table 6.1), all the correlations in Table 6.6 are significant at 1% p-value, however, the table correlates those variables that seek the challenges facing the current e-Learning system among question one for the purposes of predictions. In line with research objective four, the correlation ranges all lie between +/- (0.30 to 1.00) which displays a weak uphill relationship (see Table 6.6). Though the variables focus on the challenges facing the current e-Learning system, the challenges go with:

- ✓ Learners' home language (A7) with Prefer e-Learning designed in home language (B7);
- ✓ Prefer e-Learning designed in home language (B7) with preferred language for e-Learning (B8) and able to customise e-Learning to home language? (B11).

6.3.6. Correlation analysis of question three of the questionnaire (section C)

In section C correlations were done to determine variables that can be initiated in implementing culture-oriented e-Learning system. The correlation range lies between +/- (0.30 to 1.00) which is markedly significant but weakly positive (see Annexure I). The p-value is at 1% and Table 6.7 measures the significance of the research question in achieving the mandate of the research objective four.

Table 6.7: The multivariate correlation of how culture-oriented e-Learning can be implemented to assist learners better

Research Question	Correlation	P-Value	Correlation	Level of Significance
C23/C27	0.13144	0.0004	Weak positive	Significant
C23/C28	0.14736	<.0001	Weak positive	Significant
C23/C29	0.10678	0.0039	Weak positive	Significant
C23/C31	0.14226	0.0001	Weak positive	Significant
C23/C32	0.15945	<.0001	Weak positive	Significant
C23/C33	0.15930	<.0001	Weak positive	Significant
C27/C28	0.20702	<.0001	Weak positive	Significant
C27/C30	0.07568	0.0412	Weak positive	Significant
C27/C33	0.12389	0.0008	Weak positive	Significant
C27/C34	0.21098	<.0001	Weak positive	Significant
C28/C29	0.23207	<.0001	Weak positive	Significant
C28/C30	0.24469	<.0001	Weak positive	Significant
C28/C31	0.25336	<.0001	Weak positive	Significant
C28/C32	0.10113	0.0063	Weak positive	Significant
C28/C33	026231	<.0001	Weak positive	Significant
C28/C34	0.26967	<.0001	Weak positive	Significant
C29/C30	0.31472	<.0001	Weak positive	Significant
C29/C31	0.26667	<.0001	Weak positive	Significant
C29/C33	0.21583	<.0001	Weak positive	Significant
C29/C34	0.21358	<.0001	Weak positive	Significant
C30/C31	0.33704	<.0001	Weak positive	Significant
C30/C33	0.24355	<.0001	Weak positive	Significant
C30/C34	0.21014	<.0001	Weak positive	Significant
C31/C32	0.12595	0.0007	Weak positive	Significant
C31/C33	0.33058	<.0001	Weak positive	Significant
C31/C34	0.21514	<.0001	Weak positive	Significant
C32/C33	0.20682	<.0001	Weak positive	Significant
C32/C34	0.15650	<.0001	Weak positive	Significant
C33/C34	0.36946	<.0001	Weak positive	Significant

**=significant at the 1% level.

As noted on Table 6.1, this correlation level of significance of this study is at 1% p-value (see Table 6.1). Table 6.7 contains the correlation variables used in testing the relationship between variables for the purposes of prediction and decision in the study. The table shows a weak

uphill relationship, notably, the results of the correlated variables are significant for the purposes while the detailed discussion is presented in section 6.6 below. The variables emphasise how to implement culture-oriented e-Learning system that serves the needs of learners. The correlations lie in the following variables:

- ✓ Using e-Learning support more importantly in major modules (C23) with whether learners think cultural factors have an impact upon on e-Learning (C27), think community factors can help shape learning capacity (C28), think admin. factors be considered in eLearning design (C29), does learning style assist students to focus (C31), do lecturers assist on how to use eLearning (C32) and does AEF assist you to stay focused on e-Learning field (C33);
- ✓ Determine if learners think cultural factors have impact upon on e-Learning (C27) with think community factors can help shape learning capacity (C28), think content factors are important to students on eLearning (C30), does learning style assist students to focus (C31), does AEF assist you to stay focused on e-Learning field (C33) and think above-listed factors are important to e-Learning system (C34);
- ✓ Think community factors can help shape learning capacity (C28) with think admin. factors be considered in eLearning design (C29), think content factors are important to students on eLearning (C30), does learning style assist students to focus (C31), do lecturers assist on how to use eLearning (C32), does AEF assist you to stay focused on e-Learning field (C33) and think above-listed factors are important to e-Learning system (C34) in other hand, vice versa with think content factors are important to students on eLearning (C30), does learning style assist students to focus (C31), does AEF assist you to stay focused on e-Learning field (C33) and think above-listed factors are important to e-Learning system (C34);
- ✓ Think content factors are important to students on eLearning (C30) with does learning style assist students to focus (C31), does AEF assist you to stay focused on e-Learning field (C33) and think above-listed factors are important to an e-Learning system (C34);
- ✓ Does learning style assist students to focus (C31) with doing lecturers assist on how to use the e-Learning (C32), does AEF assist you to stay focused on e-Learning field (C33) and think above-listed factors are important to the e-Learning system (C34);
- ✓ Do lecturers assist in how to use e-Learning (C32) with does AEF assist you to stay focused on e-Learning field (C33), think above-listed factors are important to eLearning system (C34) and vice versa.

6.3.7. Correlation analysis of question two and three of the questionnaire (section B and C respectively)

This section of the study highlights section B and Section C of the quantitative research question. Table 6.8 correlates variables from both questions at 1% p-value with the correlation range of +/- (0.30 to 1.00). The correlation measures the strength of both values regarded as weak uphill and significant for the purposes of prediction. Nonetheless, the variables correlated aimed at determining the challenges facing the current e-Learning system and how to implement culture-oriented e-Learning to serve learners (see Annexure J). All the variables within the p-value numbers will be used to address research objective four (4).

Table 6.8: The multivariate correlation of question two and three

Research Question	Correlation	P-Value	Correlation	Level of Significance
A7 – B7	0.12816	0.0005	Weak positive	Significant
C31 – B17	-0.10258	0.0056	Weak negative	Significant
C32 – B11	0.09106	0.0056	Weak positive	Significant
C33 – B17	-0.08836	0.0171	Weak negative	Significant

**=significant at the 1% level.

Correlations are usually measured at 1% p-value. As mentioned earlier (Table 6.1), Table 6.8 consists of values that determine factors challenging e-Learning systems and how culture-oriented e-Learning could be implemented in serving learners better, while the discussion is presented in section 6.6 below. The following variables are correlated:

- ✓ Learners' home language (A7) with preferring e-Learning designed in home language (B7)
- ✓ Does learning style assist students to focus (C31) correlated with elements of cultural influence on e-Learning (B17);
- ✓ Do lecturers assist on how to use eLearning (C32) correlated with ability to customise eLearning to home language (B11);
- ✓ Does AEF assist you to stay focused on e-Learning field (C33) correlated with elements of cultural influence on e-Learning (B17)

6.4. CHI-SQUARE ANALYSIS

Chi-square hypothesis tests cover testing the structure of output in examining if a single variable pattern displays guided or same output. In this study, it also tests if two variables randomly relate in output or producing the same pattern of output. Furthermore, chi-square tests can be done in three parts (Wegner, 2012):

- ✓ Test whether two independent variables are associated,
- ✓ Test whether two dependent variables are related,
- ✓ Test for the equality of two or more populations (example; is students' perception of culture at NWU the same with students at UCT?),
- ✓ Test goodness-of-fit (is the students' mark distributed correctly?).

For the purpose of this study, the first part of the chi-squared test (check Chi-Square) was mainly used in the study and the full discussion on findings was done in section 6.6 below. It was used to determine the association between two independent variables in regard to the topic and objectives (see Table 6.9 to 6.19). The chi-square in the study is for the null and alternative hypothesis. The test analysed only those variables important to this study:

Prefer e-Learning design in home language (B7) against South African (SA) language (A7).

This Chi-squared Table test is to determine the degree of freedom among different SA languages and learners' preference of e-Learning system designed to a home as opposed to conventional language English. The table tests the hypothesis at the alpha level of significance at 0.05.

Table 6.9: Views of learners on e-Learning design in home language and SA language

	Value	Df	Asymp. Sig. (2-sided)
Chi-Square	77.414[a]	22	.000
Likelihood Ratio	70.006	22	.000
Linear-by-Linear Association	11.940	1	.001
N of Valid Cases	728		

a. 625 cells (96.5%) have expected count less than 5. The minimum expected count is .00.

H_0: E-Learning design in home language (null hypothesis)

H_1: E-Learning design not in home language (alternate hypothesis)

The Chi-square distribution table arrived at 22 degrees of freedom along the row at the value of X^2 at 77.414. On the probability levels, the alpha level of significance is 0.05. As the p-value of 0.000 is less than the significance level of 0.05 (i.e. $p < 0.05$), the null hypothesis is rejected.

H_1: Accepted alternate hypothesis (Learners [participants] accept that e-Learning system should not be designed in the home language in regard to culture).

The language to understand more of e-Learning (B8) against South African (SA) language (A7)

This Chi-squared Table test is to define the degree of freedom amid different SA languages and the language learners can use and understand well while working with e-Learning system.

Table 6.10: Views of learners with language to understand more on e-Learning and South Africa (SA) language

	Value	Df	Asymp. Sig. (2-sided)
Chi-Square	45.125[a]	22	.003
Likelihood Ratio	45.796	22	.002
Linear-by-Linear Association	.738	1	.390
N of Valid Cases	728		

a. 625 cells (96.5%) have expected count less than 5. The minimum expected count is .00.

H_0: The language learners can understand more on e-Learning (null hypothesis)

H_1: The language learners will not understand more on e-Learning (alternative hypothesis)

To this table, the Chi-square distribution table arrived at 22 degrees of freedom along the row at the value of X^2 at 45.125. On the probability levels, the alpha level of significance is 0.05. It shows that the p-value is less than 0.05 (actually at 0.003). However, the p-value of 0.003 is less than the conventional significance level of 0.05 (i.e. $p < 0.05$), this rejects the null hypothesis.

H_1: Accepted alternate hypothesis (Learners [participants] accept that no single language can e-Learning system learning and usage easier).

Ability to customise e-Learning to home language (B11) against South African (SA) language (A7)

This Chi-squared table test is to determine the degree of freedom and understanding of the relationship between different SA languages and learners ability to customise e-Learning system in their language of choice.

Table 6.11: Views of learners on customisation of e-Learning to home language and SA language

	Value	Df	Asymp. Sig. (2-sided)
Chi-Square	31.739[a]	22	.082
Likelihood Ratio	30.731	22	.102
Linear-by-Linear Association	.041	1	.840
N of Valid Cases	728		

a. 625 cells (96.5%) have expected count less than 5. The minimum expected count is .00.

H_0: The ability not to customise e-Learning system to learner's home language (null hypothesis)

H_1: The ability to customise e-Learning (alternative hypothesis).

This Chi-square distribution table arrived at 22 degrees of freedom reading along the row at the value of X^2 at 31.739. On the probability levels, the alpha level of significance is 0.05. It shows that the p-value is above 0.05 (actually at 0.082). Meanwhile, the p-value of 0.082 is greater than the conventional significance level of 0.05 (i.e. $p > 0.05$) and fails to reject the null hypothesis.

H_0: Accepted null hypothesis (Learners [participants] accepted they inability to customise e-Learning system to their language of choice).

The impact upon learning process (B18) against the elements/part of culture that influence e-Learning usage (B17)

This Chi-squared Table test is to decide the degree of freedom between the elements/parts of culture that influences e-Learning usage and the actual impact upon these elements on e-Learning learning process.

Table 6.12: Views of learners of the impact upon cultural elements/parts of e-Learning design process and significant influences

	Value	Df	Asymp. Sig. (2-sided)
Chi-Square	1890.325[a]	583	.000
Likelihood Ratio	673.606	583	.005
Linear-by-Linear Association	.028	1	.868
N of Valid Cases	728		

a. 625 cells (96.5%) have expected count less than 5. The minimum expected count is .00.

H_0: The impact upon cultural elements/parts on e-Learning process (null hypothesis)

H_1: No cultural elements/parts impact upon e-Learning process (alternative hypothesis).

The Chi-square distribution table arrived at 583 degrees of freedom along the row at the value of X^2 at 1890.325. On the probability levels, the alpha level of significance is 0.05. It shows that the p-value is less than 0.05 (actually at 0.000). However, the p-value of 0.000 is less than the usual significance level of 0.05 (i.e. $p < 0.05$) then reject the null hypothesis.

H_1: Accepted the alternative hypothesis (Learners [participants] accepted that cultural elements/parts do not influence or impact upon e-Learning process).

Issues of e-Learning (C25) against describing the current e-Learning system (B14)

This Chi-squared Table test is to determine the degree of freedom among the current e-Learning system and issues facing e-Learning system.

Table 6.13: Views of learners on current issues facing e-Learning usage and design

	Value	Df	Asymp. Sig. (2-sided)
Chi-Square	28.396[a]	18	.056
Likelihood Ratio	25.568	18	.110
Linear-by-Linear Association	7.245	1	.007
N of Valid Cases	728		

a. 625 cells (96.5%) have expected count less than 5. The minimum expected count is .00.

H_0: The issues facing e-Learning system (null hypothesis).

H_1: No issues facing e-Learning system (alternative hypothesis).

The Chi-square distribution table arrived at 18 degrees of freedom reading along the row at the value of X^2 at 28.396. On the probability levels, the alpha level of significance is 0.05. This shows that the p-value is above 0.05 (actually at 0.056). However, the p-value of 0.056 which is greater than the conventional significance level of 0.05 (i.e. $p > 0.05$) fails to reject the null hypothesis.

H_0: Accepted null hypothesis (Learners [participants] accepted that the current e-Learning system is facing confrontations).

Cultural factors impact upon (C27) against the elements/part of the culture that influences e-Learning usage (B17).

This Chi-squared Table test is to know the degrees of freedom between the elements/parts of culture that influence e-Learning usage and the impact upon cultural factors on e-Learning.

Table 6.14: Views of learners with cultural factors impact upon and influencing e-Learning usage

	Value	Df	Asymp. Sig. (2-sided)
Chi-Square	196.742[a]	159	.022
Likelihood Ratio	202.943	159	.011
Linear-by-Linear Association	.195	1	.658
N of Valid Cases	728		

a. 625 cells (96.5%) have expected count less than 5. The minimum expected count is .00.

H_0: Cultural factors impact upon on e-Learning system (null hypothesis).

H_1: Cultural factors are not impact upon e-Learning system (alternative hypothesis).

The Chi-square distribution table arrived at 159 degrees of freedom along the row at the value of X^2 at 196.742. On the probability levels, the alpha level of significance is 0.05. It shows that the p-value is less than 0.05 (actually at 0.022) and rejects the null hypothesis.

H_1: Accepted the alternative hypothesis (Learners [participants] accepted the fact that cultural factors have no real impact upon e-Learning system).

Community factors impact upon (C28) against learning style assisting learners to remain focused in the learning (C31).

The Chi-square test in the next table is to understand how the degrees of freedom between community factors impact upon the learning style assisting learners to remain focused in the process.

Table 6.15: Views of learners on how community factors impact upon learning style

	Value	Df	Asymp. Sig. (2-sided)
Chi-Square	121.092[a]	9	.000
Likelihood Ratio	97.510	9	.000
Linear-by-Linear Association	46.666	1	.000
N of Valid Cases	728		

a. 625 cells (96.5%) have expected count less than 5. The minimum expected count is .00.

H_0: Community factors impact upon learning style (null hypothesis).

H_1: Community factors are not impact upon the learning style (alternative hypothesis).

The Chi-square distribution table arrived at 9 degrees of freedom reading along the row at the value of X^2 at 121.092. On the probability levels, the alpha level of significance is 0.05. The p-value of 0.000 is less than the usual significance level of 0.05 (i.e. $p < 0.05$) rejecting the null hypothesis.

H_1: Accepted alternative hypothesis (Learners [participants] accepts that community factors are impact upon learning style in e-Learning system).

Assistance by administrative factors (C29) and the technical problems encountered using e-Learning (C20).

This Chi-squared Table test is to determine the degrees of freedom for the technical problems encountered while using e-Learning and the level of assistance rendered by administrative factors.

Table 6.16: Views of learners with administrative factors assistance on technical problems

	Value	Df	Asymp. Sig. (2-sided)
Chi-Square	21.036[a]	12	.050
Likelihood Ratio	24.498	12	.017
Linear-by-Linear Association	.046	1	.830
N of Valid Cases	728		

a. 625 cells (96.5%) have expected count less than 5. The minimum expected count is .00.

H0: Administrative factors roles (null hypothesis)

H1: Administrative factors roles are not important (alternative hypothesis)

The Chi-square distribution table arrived at 12 degrees of freedom along the row at the value of X^2 at 21.036. On the probability levels, the alpha level of significance is 0.05 and the p-value of 0.050 is equal to the usual significance level of 0.05 (i.e. p equal to 0.05) rejecting the null hypothesis.

H_1: Accepted alternative hypothesis (the administrative factors are not important to learners [participants], and then the hypothesis is accepted).

Institutions' encouragement of e-Learning usage (C20) against the technical problems encountered in using e-Learning (B13).

This Chi-squared test table below is to ascertain the degree of freedom between the number of encouragement learners received while using e-Learning and the technical problems encountered by learners using e-Learning.

Table 6.17: Views of learners with institutions encouragement of e-Learning and resolving technical challenges on usage

	Value	Df	Asymp. Sig. (2-sided)
Chi-Square	15.724[a]	8	.047
Likelihood Ratio	15.546	8	.049
Linear-by-Linear Association	.012	1	.913
N of Valid Cases	728		

a. 625 cells (96.5%) have expected count less than 5. The minimum expected count is .00.

H_0: The technical problems encountered by learners using e-Learning (null hypothesis).

H_1: Learners do not encounter any technical problems while using the e-Learning system (alternative hypothesis).

The Chi-square distribution table arrived at 8 degrees of freedom along the row at the value of X^2 at 15.724. On the probability levels, the alpha level of significance is 0.05 and the p-value of 0.047 is less than the typical significance level of 0.05 (i.e. $p < 0.05$) and the null hypothesis was rejected.

H_1: Accepted alternative hypothesis (Learners [participants] accepted the hypothesis because participants felt that e-Learning is not encountering a technical problem).

The level of assistance from lecturers when using e-Learning (C32) against e-Learning forum supporting and encouraging (C22).

This Chi-squared Table test is to determine the degree of freedom between I found e-Learning forum supporting and encouraging and the level of assistance from lecturers while using e-Learning system.

Table 6.18: Views of learners with lecturer's assistance on e-Learning usage

	Value	Df	Asymp. Sig. (2-sided)
Chi-Square	108.318[a]	15	.000
Likelihood Ratio	69.976	15	.000
N of Valid Cases	728		

a. 625 cells (96.5%) have expected count less than 5. The minimum expected count is .00.

H_0: Found e-Learning easy because of lecturers assistances (null hypothesis).

H_1: Lecturers are not assisting (alternative hypothesis).

The Chi-square distribution table arrived at 15 degrees of freedom along the row at the value of X^2 at 108.318. On the probability levels, the alpha level of significance is 0.05 and the p-value of 0.000 is less than the usual significance level of 0.05 (i.e. $p < 0.05$) rejecting the null hypothesis.

H_1: Accepted alternative hypothesis (e-Learning system is not easy to use no matter the level of assistance from lecturers).

Community factors helping to shape learning capacity (C28) against AEF assisting learners to remain focused in the learning field (C33).

The next Chi-squared Table test is to define the degree of freedom between community factors helping to shape learners learning capacity and AEF assisting them to remain focused in the learning field.

Table 6.19: Views of learners with community factors and AEF helping learners with e-Learning being focused

	Value	Df	Asymp. Sig. (2-sided)
Chi-Square	150.406[a]	9	.000
Likelihood Ratio	127.930	9	.000
Linear-by-Linear Association	50.023	1	.000
N of Valid Cases	728		

a. 625 cells (96.5%) have expected count less than 5. The minimum expected count is .00.

H_0: AEF assisting learners in the learning field (null hypothesis).

H_1: AEF is not assisting learners in the learning field (alternative hypothesis).

The Chi-square distribution table arrived at 9 degrees of freedom along the row at the value of X^2 at 150.406. On the probability levels, the alpha level of significance is 0.05 and the p-value

of 0.000 is less than the usual significance level of 0.05 (i.e. $p < 0.05$) rejecting the null hypothesis.

H_1: Accepted alternative hypothesis (Learners [participants] accepted their inability to focus in the learning field because of assistance from AEF).

6.5. DISCUSSION OF FINDINGS

These discussions consist of the descriptive data (section 6.3); correlation (section 6.4) and chi-square results (section 6.5) above. The discussions are done per research objectives in chapter one and Table 4.2.

6.5.1. The impact of culture on the design of e-Learning system

This study follows a number of objectives; among the objectives is the need to understand cultural factors that impact upon in the design of an e-Learning system which is the first objective. Understanding of this impact upon involves questions addressing the research objectives as well as the problem statement.

6.5.1.1. Discussion of quantitative findings as per research question, question two (section B)

With regard to Figure 6.1 the overall respondents of 43.68% are male and 56.32% are female. This is a question to determine the gender of the participants. The chart shows the majority of the sample population were male. From the correlation in Table 6.2, there is an association between the challenges facing current e-Learning and A7 (home language) – B7 (prefer e-Learning designed in home language), B13 (institution encourages you to use e-Learning) and B18 (cultural impact upon on e-Learning), though the relationship is weak because of the learners' inability to learn in home language. The inability is shown in the descriptive data with (B7) 58.38% of the respondents not willing to have e-Learning in their home language. Also, chi-square in Table 6.9 shows that learners do not prefer e-Learning system designed in the home language. The weak relationship continued among home language (A7) and institutional encouragement of learners to use e-Learning (B13) with 86.26% of the participants encouraged by their education institutions. This relationship is supported by Tsai and Machado (2002) who believe in encouragement in e-Learning usage from educational institutions. Besides, according to Epignosis (2014), the presence of e-Learning system still lacks culture-oriented mechanisms. Also, the question (B18) correlates with (A7) in understanding the impact upon culture in the design of e-Learning system. The significance of this variable is supported by

(B18) 44.64% of the participants who believed that cultural e-Learning system would impact upon positively in making learners understand well (see Annexure O).

As shown in Table 6.2, the correlated variables B7, B8, B9 and B11, and the literature study involving Osterweil (2011) and Calvo et al. (2007) support the belief that e-Learning system is challenged as a result of lack of customisable features. These challenges are all seen in the chi-square (B8/A7) with no single language suitable for e-Learning and lack of customisation in e-Learning (see Table 6.10 and 6.11). However, according to Epignosis (2014), the current state of the e-Learning system lacks culture-orientation. The outcome shows participants' inability to customise e-Learning features.

Moreover, Information and Communications Technology (ICT) empowers e-Learning processes in dealing with teaching and learning challenges (Dac & Bregman, 2010). The question in (B9) seeks to understand from participants if they prefer learning in e-Learning over the classroom. The finding illustrates that (B9) 21.29% of the respondents prefer using e-Learning over the classroom. Participants' preference of classroom can be regarded as a challenge as a portrait from the literature of Dac and Bregman (2010). Preferred e-Learning over classroom (B9) is correlated with all these variables (B13, B14 and B18). However, the finding from B18 shows that 44.64% of the respondents believe that different cultural elements influence e-Learning in understanding content (see Annexure O). Also, all these variables are weakly correlated as an indication of the challenge and impact upon culture-oriented e-Learning execution. The variables are significant and positive to the study. According to Conati (2002), culture positively and negatively influences e-Learning.

According to Tsai and Machado (2002), learners are encouraged to take up distance learning/education. Based on this, the question in (B13) seeks to understand whether institutions encourage participants to use e-Learning. The descriptive analysis of Annexure O shows 86.26% agreeing that their institution encourages them to use e-Learning. Singh (2003) also believe that the institution promotes effective choice in using e-Learning to learn. Sun et al. (2008), regard online learning difficult because of a radical and quicker response to fix it. Participants (81.87%) of B14 felt the effectiveness of the current e-Learning; this shows a positive aspect of e-Learning system (Conati, 2002). According to Joy and Kolb (2009), cultural differences and beliefs impact upon learners' learning style and process. It also impact upon the ways of thinking and adopting and maintaining it in the society (Al-Tarawneh, 2012). However, the full statistical analysis of the questions is seen in Annexure O.

Nonetheless, the descriptive statistics of B17 indicate learners' willingness to see cultural elements and factors in the e-Learning system. For instance, a different element of culture influences e-Learning and positively impact upon e-Learning culturally (see Annexure O). But the execution of these elements remains a thing of concern and challenges of the e-Learning system (Osterweil, 2011). Singh (2003) promotes effective choice in using e-Learning to learn. However, Sun et al. (2008) regard online learning as difficult because of a radical and quicker response to fix it. The correlation result revealed that the challenges confronting the e-Learning system contribute to participants' perceptions; with 81.87% (B14) of the finding having an effective perception on the current state of e-Learning. Also, according to Joy and Kolb (2009), cultural differences and beliefs impact upon learners' learning style and process. They also impact upon the ways of thinking and adaptation into the society (Al-Tarawneh, 2012). For this reason, the chi-square between elements cultural influence on e-Learning (B17) and cultural impact upon e-Learning (B18) support the correlation with the suggestion that cultural elements don't impact upon e-Learning (see Table 6.12).

6.5.1.2. Discussion of quantitative findings as per research question, question three (section C)

In an attempt to address this research objective (to understand cultural factors that impact upon in the design of e-Learning system), variable correlations were done to achieve the purpose with the assistance of the research question (what are the challenges facing the current e-Learning system?). The respondents' opinions are summarised as follows:

An indication from the above correlation (Table 6.3) presents C20/C21/C22/C24/C25/C26 correlating with C19 in this study. The correlation starts with the relationship between e-Learning easy to use (C19) and the technical challenges facing e-Learning (C20). The finding demonstrates that participants still find e-Learning easy to use not minding the challenges experienced in the learning process. The correlation is supported by Patrick and Barton (2012), who said that e-Learning is confronted with issues which needed to be resolved for the potential to explore. The issues mentioned in the questionnaire and many more show the height of confrontation facing e-Learning usage as 90.38% (C19) of the participants realising these issues, while 60.58% (C20) experience the technical problem on e-Learning operations. It is true, e-Learning platform goes with benefits (Arman, 2010; García & Esteban, 2013), and Mohammed and Mohan (2011), think that the benefits of culture in e-Learning cannot be underrated. In support of this, 52.20% (C21) of the respondents also believe that e-Learning can assist them to attend classes continually, but, the usability of the learning system matters.

The correlated questions are an indication that technical problems and the level of support received by e-Learning users directly impact upon easy usage of e-Learning system and all of these contribute to the current challenges of the e-Learning system. On the other hand, the chi-square in Table 6.13 indicates that e-Learning system is confronted with challenges. These challenges affect the overall design and implementation of the conventional e-Learning system, but framework of this study eliminates such challenges.

According to Mayes and de Freitas (2004), the embedment of culture in learning will allow easy flow of e-Learning software. According to the participants' views, 78.16% (C24) of the respondents believe that e-Learning promotes good learning experience which is supported by Singh (2003). Another finding shows 94.51% (C25) of the learners' express concern about e-Learning usability which is attributing to e-Learning lack of cultural elements, 60.71% (C26) of the participants want to see the existence of e-Learning in future. Besides, Radović-Marković (2010) foresees a bright promising future for online education, e-Learning and others. The current transformation in academic organisations increases e-Learning tools and usage and is believed to be doubled soon in the near future (Oye et al., 2012).

The variables C21, C22, C24 and C26 were correlated with C20, shows weakly positive relationship but significant in the study. Teaching and learning generally experience technical challenges (Andrew, 2011) and to understand and answer the technical challenges, the findings indicate that 60.58% of the participants usually experience technical problems in e-Learning (C20). The variable relationship shows the ability of the technical problem directly impact upon the supporting of e-Learning in the teaching and learning process. According to Joy and Kolb (2009), cultural differences and beliefs impact upon learners' learning style and process. It also impact upon the ways of thinking and adopting into the society (Al-Tarawneh, 2012). Again, e-Learning promotes favourable resource allocation and learning experience (Lanzilotti et al., 2006) as seen among 73.49% (C22), (C24) 78.16%. While (C26) 60.71% of the participants want to see course delivery using e-Learning platform in future not minding the challenges. But, culture-oriented e-Learning system remains challenged (Osterweil, 2011, Calvo et al., 2007).

In addressing research objective one, these variables, C22, C24, C26 correlate with C21 and the correlation outcome is weak positive but significant to the analysis (see Table 6.5). The aim of C21 is to understand whether e-Learning support will make learners attend classes more. The analytical finding proves that 52.20% (C21) of the participants see position support from

e-Learning and also see the implementation phase of ADDIE as helping to support learners to understand more of the learning process (Arkün & Akkoyunlu, 2008). There is the need for a good learning environment that provides support, expertise, advanced performance and multiple supports for the prospective learner (Zualkernan, 2006). E-Learning promotes favourable resource allocation and learning experience (Lanzilotti et al., 2006). The future should be rooted in learners' culture-mindedness in addressing challenges in the research objective and allowing the e-Learning system to accommodate all learners. Besides, Table 6.18 (chi-square) suggests that lecturers' efforts are not reflecting and encouraging in the usability of the e-Learning system which can reflect on the next correlation. The findings from the correlation and data analysis prove that favourable alignment with the future expectation of e-Learning reflects positive usage. But challenges confront e-Learning and lack in culture-oriented e-Learning.

6.5.1.3. Discussion of quantitative findings as per research question, question two and three (section B and C respectively)

This section of the correlation is a combination of variables between research question two and three in addressing research objective one (see Annexure F and Table 6.4). There is a weak correlation among A7, B7, B8, B9, B11, B13, B14, B15, B17 and B18 in an attempt to add a positive solution to research objective one. But culture-oriented e-Learning system remains challenged (Osterweil, 2011, Calvo et al., 2007). The researcher sought to understand learners' preferred language for the e-Learning learning processes (B8) in which 60.44% of the respondent's favoured English language against any other language as viewed above. Learners' preference of e-Learning system over classroom (B9) indicates that 90.38% (C19) of the respondents find e-Learning easy to use, and, according to Patrick and Barton (2012), e-Learning is confronted with issues which need to be resolved for the benefits to flow in.

The literature study shows that teaching and learning generally experience technical challenges (Andrew, 2011) as seen in C20. According to Mayes and de Freitas (2004), the embedment of culture on learning allows easy flow of e-Learning software in support of question C19. Also, the correlation relates to level of support (C21) that learners receive in the e-Learning forum (C22) (see Table 6.2) and, according to Barik and Karforma (2012), a technical and teacher support is paramount. Addressing the challenges confronting the design and usability of e-Learning shows (C24) that 78.16% of the respondents agree with favourable learning experience from e-Learning. While (C25) 94.51% of the participants fully acknowledged different kinds of issues that confront the usability of the e-Learning system, these issues need

a framework (culture-oriented system) to tackle it. The correlation between B11/C19 establishes the ability to customise e-Learning features culturally, and, from the findings, (B11) 44.09% of the respondents are not able to customise e-Learning to the home language. This shows the absence of cultural customisation of e-Learning features and the finding relate to e-Learning easy to use (C19) (Annexure P). In all this, the chi-square finding in Table 6.13 shows the inability of the learner to customise the e-Learning system. As indicated in the literature study, e-Learning is heavily challenged (Osterweil, 2011, Calvo et al., 2007) on the culture-oriented platform and this challenge can be seen in the lack of features customisation.

Education institutions' encouragement of the use of e-Learning (B13) shows weak positively as it relates with home language A7 and C19, C22, C24, C25 (Table 6.4). The weak correlation exists as a result of ignorance and negligence of culture-oriented e-Learning and this relationship can be explored because of learners' interest in seeing e-Learning systems designed in a language of choice. However, 90.38% (C19) of participants indicate that education institutions can make e-Learning user-friendly by encouraging more users culturally. In accordance with Tsai and Machado (2002), learners are encouraged to take up distance learning/education that involves e-Learning system. According to Mayes and de Freitas (2004), the embedment of culture on learning allows easy flow of e-Learning software. Institutional encouragement is seen by 73.49 % (C22) saying that their institutions encourage them to use e-Learning. This encouragement can impact upon the success or failure of the implementation of the culture-oriented system (Leidner & Kayworth, 2006). The correlation supports the literature study from Lanzilotti et al. (2006) which suggests that the e-Learning system promotes positive learning experience. While different issues confront the e-Learning system (C25), 94.51% of the respondents experience different kinds of issues in the e-Learning system. To support this finding, Patrick and Barton (2012) assert that different issues confronting e-Learning should be resolved for e-Learning to be effective.

About 81.87% of the participants felt that the current e-Learning system is effective (B14), which is tantamount to the easy usage of e-Learning system C19 and many others C20, C22, and C24. About 60.58% (C20) of the participants face technical problems on e-Learning in general, and, according to Andrew (2011), teaching and learning on e-Learning face technical challenges which can hinder the potential benefits attached to the e-Learning system. To Singh (2003), users' perception promotes effective choice in using e-Learning to learn. However, there are different kinds of challenges that learners face compared to the classroom (B15); 97.80% of the respondents face single issues (see Annexure O), by Olaniran (2009) believes

that e-Learning is subjected to challenges compared to the conventional. Also, culture-oriented e-Learning system remains challenged (Osterweil, 2011, Calvo et al., 2007).

According to Conati (2002), culture influences e-Learning positively and negatively and data from (B17) shows that 81.87% of participants agree that different kinds of elements influence the e-Learning system. This variable correlates with (C25) which indicates 94.51% of the participants facing different issues on the current e-Learning system. According to Joy and Kolb (2009), cultural differences and beliefs impact upon learners' learning style and process. This also impact upon their ways of thinking about the system and adoption into society (Al-Tarawneh, 2012). This literature also proves that culture can impact upon or influence learners' learning pattern. There is a weak negative correlation relationship between the variables in B18, A7, C21 and C24 but which is regarded as significant and important to this study. In addition, 44.64% (B18) of the participants believe that the cultural e-Learning system improves their understanding (see Annexure O). The findings are backed by Mohammed and Mohan (2011) who state that cultural e-Learning involves benefits and cannot be underrated. And, according to Lanzilotti et al. (2006), e-Learning promotes favourable learning experience and environment.

6.5.2. How culture is captured and represented in the implementation of e-Learning system

This section of the discussion deals on what it takes in the capturing and representation of culture in the development of e-Learning system; see the questionnaire in Annexure B for the results.

6.5.2.1. Discussion of quantitative findings as per research question, question three (section C)

The following variables correlate C23 – C27. C28, C29, C31, C32, C33 with one another in providing solutions to research objective two (Table 6.9). According to Mohammed and Mohan (2011), important cultural influencing factors are often discarded when designing e-Learning systems. Georgouli et al. (2008) and Blanchard et al. (2005), all believe in the need to integrate cultural factors into e-Learning design and implementation. There is the need to recognise the cultural factors that must be included in e-Learning; variable (C27) was tested whether e-Learning system supports learners in their modules (C23) (73.49%). The correlation between the variables is weak but significant, and, (C27) 32.55% of the respondents believe that cultural factors are important for e-Learning development. The chi-square in Table 6.16 shows that

cultural factors do not necessarily impact upon on e-Learning system, but participants believe that e-Learning is confronted with many issues (see Table 6.13).

The result indicates that 65.11% (C28) of the participants believe that community factors are important to capture in an e-Learning system. E-Learning has a positive new story to tell, easy accessibility to information anytime, anywhere allowing learners to engage with others effectively (Blanchard et al., 2005). In the theoretical framework, community factor ensures effective use of different tools in communication during teaching and learning (Georgouli et al., 2008). The chi-square test result in Table 6.15 shows that community factors are impact upon learning style in e-Learning system. According to (C29), 73.49% of the respondents accepted that administrative factors are important to capture in e-Learning system. Georgouli et al. (2008) agree with the analysis that administrative factors in e-Learning assist in the day-to-day running of the e-Learning system in monitoring and statistical evaluating of e-Learning progress (Lubega & Mugarura, 2008). The importance of administrative factors cannot be complete without seeking information from participants through chi-square (see Table 6.16).

Learning style is the preferred mode or system that suits learners to understand content (materials) in the learning environment (C31). According to Joy and Kolb (2009), learning style explains individual learning processes and suitable learning style. In the SA education context, students come from different backgrounds, society, and culture and with different characteristics, specifications and learning styles (Boondao, Hurst & Sheard, 2009). According to Barik and Karforma (2012), students (participants) use and learn with e-Learning systems in sharing and advancing knowledge. Students are the final users of e-Learning systems (Wagner, Hassanein & Head, 2008) to stay involved in the community, and their learning style should be captured. According to Lubega and Mugarura (2008), students are the people that enter into learning contract using e-Learning.

The chi-square analysis in Table 6.18 indicates the level of assistance from lecturers with the 43.96% (C32) of the participants receiving partial assistance from their lecturers and lecturers are intermediate persons between administration and students, content, learning and activity; teachers are the people that administer factors in the learning environment influenced by cultural factors (Georgouli et al., 2008). This shows that the role of lecturers cannot be underestimated in the design and functionality of e-Learning. Data finding from the correlation and data analysis indicate the important role of lecturers and participants want to see them represented in the e-Learning development framework. About, 63.74% (C33) of the

participants would like to see AEF captured in culture-oriented e-Learning system design with support from the chi-square (see Table 6.19). This factor enables the effective management of students' academic related work or activities by the lecturer/tutor (Georgouli et al., 2008). To this point, the majority of the respondents believe in the strength of AEF in e-Learning system of teaching and learning.

Variables C28, C33 and C34 are correlated with (C27) to determine the representation or capturing of cultural factors (features) in e-Learning system during development. In (C27), 32.55% of the respondents are willing to see cultural factors in their e-Learning system, (C28), 65.11% want to see community factors represented on e-Learning, while in (C34) 65.38% preferred to have all cultural factors represented on the e-Learning system. All these variables are weakly correlated but significant and the correlation is an indication that cultural factors will assist participants to remain focused in the community learning because community factors ensure that learners' learning capacity is sharpened. Learners' community is directly and indirectly impact upon cultural factors which in return influence learners. In theoretical framework terms, the community factor ensures effective use of different tools in communication during teaching and learning (Georgouli et al., 2008). Calvo et al. (2007) think that good learning approach can be attributed in effective cultural factors (Lephalala & Makoe, 2012). At this level, Mohammed and Mohan (2011), believe in the cultural influencing factors but much of it is discarded when designing the e-Learning system. Georgouli et al. (2008) and Blanchard et al. (2005), equally believe in the need of all these factors in e-Learning design and implementation.

The following variables C29, C30, C31, C32, C33, C34 are also aligned with (C28) with the aim to understand the inclusion of community factors in culture-oriented e-Learning system design. Participants believe in all these correlated factors. According to variable (C30), 80.22% of the respondents strongly believe in the importance of content factors in e-Learning which agree with the literature that good quality and well-designed content should be considered when designing e-Learning material (Sun et al. 2008). Content factors are those materials that influence the learning process and satisfaction like a study guide, textbook, hand-out, journals, magazine and many more. Quality designed materials determine learner satisfaction. Content is designed and delivered according to learner needs (FAO, 2011) and content aims to deliver effective quality materials (Wagner et al., 2008). The design is backed by chi-square analysis (see Table 6.15, 6.16, 6.17, 6.18, and 6.19).

Nonetheless, question C29 correlates with C30/C31/C33/C34 in an attempt to provide ways to capture culture in the e-Learning system design. The findings among the variables are supported by literature and chi-square finding. For example, 80.22% (C30) of participants supported content factors and others. Quality designed materials determine learner satisfaction. Content is designed and delivered according to learner needs (FAO, 2011) and content aims to deliver effective quality materials (Wagner et al., 2008). While chi-squared findings are also found in 6.15, 6.16, 6.17, 6.18, and 6.19, this dependence can realise that other factors assisting administrative factors to perform effectively in rendering quality culture-oriented e-Learning system and service to participants in the learning field.

The correlation among C30 and C31, C33, C34 indicates the research variable (C30) with 80.22% of the participants agreeing on the factor captured in culture-oriented e-Learning system. This is to say that each of the variables is important and needed in the culture-oriented framework because they indicate the descriptive percentages together with chi-square. At this level, the correlations between C31 and C32, C33, C34 are supported by literature. For example, Mohammed and Mohan (2011) say that the benefits attached on culture e-Learning cannot be underrated. E-Learning platform goes with benefits (Arman, 2010; García & Esteban, 2013), but there are a number of issues that needs to be addressed in optimising e-Learning purpose and good investment return and promoting learning style (Patrick and Barton (2012). Another finding shows (C31) 67.45% of the participants strongly agree that learning style is vital. Also, according to Joy and Kolb (2009), cultural differences and beliefs impact upon learners' learning style and process. They also impact upon ways of thinking and adopting into society (Al-Tarawneh, 2012).

6.5.3. The e-LSDF e-Learning framework that can be suitable in different cultural e-Learning environments in SA and possibly elsewhere

Indications from the study findings so far have shown a range of wiliness from the participants to see a framework that can cater for culture-oriented e-Learning system. Achieving this solution involves the combination of questions from the interview and the questionnaire section of the research. Both sections are discussed below, starting with the questionnaire:

6.5.3.1. Discussion of quantitative findings as per research question, question two (section B)

The research objective four aims to understand ways through which the e-LSDF can be implemented to serve individual learners better. Research questions one was designed to

provide those ways through which e-LSDF can be made possible through the understanding of the challenges facing the e-Learning system. Correlation of research variables in Section B was done in order to bring the finding closer to achieve the purpose of the objective. However, the research question focuses on the challenges facing the current e-Learning system.

From the above relationship in Table 6.8, e-Learning challenges are associated with the learner's home language (A7) and prefer e-Learning designed in home language (B7), preferred language for e-Learning (B8) and able to customise e-Learning to home language (B11). Tables 6.9 and 6.10 relate in highlighting the lack of home language system and learners preference and no single home language makes learning easier. Language is an integral part or element of culture, the variable (A7) focused on determining the home language of the participants. The correlation among variables is found to be weak but significant, with (B7) 58.38% of the respondents preferring to see the design in the home language. The descriptive finding is supported by chi-square in Table 6.9. The significance of this correlation is that participants would not mind having e-Learning in home language. However, according to Osterweil (2011) and Calvo et al. (2007), culture-oriented e-Learning system remained challenged. However, the data analysis and (B11) the findings prove that 44.09% of the learners have never customised e-Learning system. This shows that the ability for customisation is all to do with making e-Learning culture-oriented, but the level of the finding indicates that the e-Learning system is one language sided without recognising other languages.

6.5.3.2. Discussion of quantitative findings as per research question, question three (section C)

As noted in the research question (second category no 2) in Chapter one, the questions seek to understand how culture is captured to serve participants well with the purpose of this study objective at heart. In relation to Table 6.7 above, implementing culture-oriented e-Learning that serves the need of the learners is done using correlation, chi-square and literature studies. The following correlation C23, C27, C28, C29, C30, C31, C32 and C33 relate with C34, all according to the literature and can assist in implementing the culture-oriented e-Learning system. However, culture plays an important role in any culture-oriented e-Learning system in affecting positively learning modules. According to Calvo et al. (2007), good learning approach can be attributed to effective cultural factors (Lephalala & Makoe, 2012).

In support of this, the data analysis shows in (C23) that 76.10% of the participants expressed the importance of e-Learning in their modules (C23) while 65.11% of (C28) agreed on the

capacity of community factors in shaping their learning styles. The ability of learners to benefit maximally from the learning community means the presence of an administrative package to present the modules in an acceptable manner. Georgouli et al. (2008) believe that administrative factors in e-Learning assist in the day-to-day running of an e-Learning system in monitoring and statistical evaluation of the e-Learning progress (Lubega & Mugarura, 2008). However, the finding shows that participants still believe that e-Learning platform is important in their core module at school as well as administrative factor in constructing e-LSDF. Calvo et al. (2007) attribute a good learning approach to effective cultural factors (Lephalala & Makoe, 2012). To support or reject this claim, the variable (C27) seeks to determine if participants value the essence of cultural factors in e-Learning (see Annexure P).

Though community factors allow for learners' effective communication, content distribution and information gathering in the e-Learning process (Georgouli et al., 2008), they also ensure knowledge improvement and many more (Sun et al., 2008) and Table 6.15 finding shows chi-square backing up the literature. According to Georgouli et al. (2008), administrative factors in e-Learning assist in the day-to-day running of e-Learning system in monitoring and statistically evaluating e-Learning progress (Lubega & Mugarura, 2008). The finding indicates that (C29) 73.49% of the respondents appreciate the need for administrative factors and their role culture-oriented e-LSDF. Nonetheless, good and well-designed content should be considered when designing e-Learning materials (Sun et al. 2008). Quality designed material determines learner satisfaction. Contents are designed and delivered according to learner needs (FAO, 2011) and contents aim to deliver effective quality materials (Wagner et al., 2008). The entire finding reveals that 80.22% of the respondents strongly believe in the importance and the need for content factors in e-Learning.

Statistical data finding on (C31) shows that 64.45% of all the participants believe in a positive learning styles in the design of culture-oriented e-Learning. To this point, question (C33) aims to determine from participants if AEF assists them to remain focused in the learning arena. The highlight of the correlation shows the function of community factors as 65.38% (C34) of the participants believe in culture-oriented factors, meaning participants would like the representation of all e-Learning factors in the development framework.

6.5.3.3. Discussion of quantitative findings as per research question, question two and three (section B and C respectively)

As a mark of reminder in accordance with the research question (second category number 1 and 2) in Chapter one, this section of the study presents the combination of correlation from both research questions. The first (1) question focused on understanding the real challenges that students face in using the e-Learning system, while the second (2) research question seeks to understand how culture is captured to serve participants well with the purpose of this study at heart. Both correlated questions aimed to achieve the purpose of the research objective number four (4) in an attempt to construct e-LSDF that carries cultural background of different learners in the learning field. The correlated variables are found in Tables 6.1 and 6.2 above.

Referring back to Tables 6.1 and 6.2, language is an integral part or element of culture, the question focused on determining the home language of the participants. The (A7) variable is correlated with variable (B7) and the effort of providing or developing e-LSDF. The correlation is seen as weak but significant and as an indication of a relationship to developing culture-oriented e-Learning system framework that can accommodate diverse participants' cultural background.

However, earlier, it was noted that learning styles assist participants to focus on the learning process (C31). Learning style is the preferred mode or system that suits learners to understand content in the learning environment. The correlation between both variables (C31/B17) is weak negative but significant to the aim of this discussion and the fact that learners learning styles are affected by cultural factors. To manage this impact upon and influence in accordance with the response from participants means to recognise learning styles among the cultural influencing factors on e-LSDF culture-oriented e-Learning. According to Joy and Kolb (2009), learning style explains individual learning processes and suitable style. Culture-oriented integration is as the result of learners' diversification (Boondao, Hurst & Sheard, 2009).

Nonetheless, the role of lecturers cannot be undervalued in the design and functionality of e-Learning. The question (C32) was correlated with (B11) to understand the relationship between customisation of the e-Learning system and lecturer's assistance. The finding shows that lecturers can be good to learners if e-Learning system is made customisable. This means the ability of a customisable system shaped by lecturer's assistance. To this point, question (C33) aimed to determine from the participants if AEF assists them to remain focused in the learning arena. This question was correlated with (C33 and B17) to seek the link among the questions

in an attempt to add views in developing e-LSDF that can suit different learners across various backgrounds in the learning community. The correlation finding showed a strong and weak negative respectively but significant to this study by addressing the purpose of the research objective. The correlation proves important elements worth considerable in e-LSDF.

6.6. CHAPTER SUMMARY

This chapter offered and discussed the questionnaire techniques with the aim to provide analysis of the processes achieved through data management, creation of variables and quantitative analysis and process. The chapter also covered descriptive statistics and frequencies, correlation analysis and chi-square on the research questions. The descriptive statistics used were generated through SARS and SPSS statistical software. The presentation of data correlation was done by testing the strength of the variables and their significance as they address the research objectives. Chi-square analysis was deployed to test and understand the null and alternative hypothesis that seek more clarity on the research objectives, questions and problems. Overall, the chapter achieved its mandate through its presentations and analysis towards understanding what participants felt about e-Learning in relation to the culture-oriented e-Learning system.

Here are some of the findings but not limited to these: learners' inability to learn in home language; participants are encouraged by their education institutions to use e-Learning system, and they also believe that cultural e-Learning system would impact positively in making them have better understanding. However, the findings also show lack of customisation in e-Learning system features; respondents believe that different cultural elements influence their understanding of e-Learning contents. Participants further alluded their willingness to see cultural elements and factors in the e-Learning system. Even though, the results indicate that respondents experience technical problems on e-Learning operations, the participants suggests that education institutions can make e-Learning user-friendly by encouraging more users culturally e-Learning systems. The user-culturally e-Learning system involves the cultural, community and many other factors as noted above, as these factors are very important for e-Learning systems development. Nonetheless, the factors and elements inform the culture-oriented e-Learning system and were supported by participants in the views that they submitted (see Section 6.5). The next chapter presents the full research conclusions and identifies areas for future study, including citing the limitations and a framework for managing learners' culture in developing the e-Learning system.

CHAPTER SEVEN

RESEARCH CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE STUDY

7.1. INTRODUCTION

The previous chapter dealt with analysis and the interpretation of data collected through questionnaires. The entire study cannot be complete without a compound summary and suggestions for future study. This chapter covers the depth and breadth of the study from chapter one to six, aligning the chapters together with the product of a culture-oriented e-Learning framework (Figure 7.1). The overall aim of this chapter is to summarise the entire study conducted, and the application of its findings in practice. The literature study showed mixed reactions to a culture-oriented e-Learning system. The participants views in the analysis and rationale in this study however suggests support for a culture-oriented system development framework.

The overall study investigated culture on e-Learning system with the idea of coming up with a culture-oriented e-Learning framework that addresses this lack of culture on e-Learning. The chapter includes the following format; research questions, answers elicited to the research questions, summary of the study, alignment of qualitative and quantitative data, limitations of the study, validation of the study findings, major contributions to the body of knowledge, suggestions for the future study and provides a conclusion.

7.2. THE RESEARCH QUESTIONS

For e-Learning to achieve its mandate and be productive, there is a need for e-LSDF consideration, as a result of the effect of culture on e-Learning. Again, in achieving the cultural dimension and addressing the problem statement, the following questions were derived from the problem statement:

Primary research question

- ✓ What are the factors that should be considered when designing an e-Learning System (e-LS)?

First category research questions are:

- ✓ How do cultural differences impact upon e-Learning system design and implementation in SA?
- ✓ How is culture captured in the development of e-Learning system?
- ✓ What are the challenges faced in the development of e-Learning systems?

Second category research questions are:

- ✓ What are the challenges facing the current e-Learning system?
- ✓ How can culture-orientated e-Learning system be implemented to assist learners better?

7.3. ANSWERS TO THE RESEARCH QUESTIONS

The "the answers to the research questions" are summary of the findings drawn from the research questions which are categorised into two parts: interview questions (qualitative) and a questionnaire (quantitative). The interview consists of four questions with the focus on e-Learning developers, analysts and administrators while the second part is the questionnaire covering two major questions and focuses on learners (students) as the source of data. The fundamental purpose of the questionnaire was to draw input from the learners in this study in order to understand their intake on the culture-oriented e-Learning system. The discussion of the findings was done per the questions listed in section 7.2 above to provide answers to the research questions. Then, 7.3.1 to 7.3.4 covers the qualitative questions while 7.3.5 and 7.3.6 focused on the quantitative questions.

7.3.1. What are the factors that should be considered when designing an e-Learning System (e-LS)?

This question sought to understand the cultural issues to be considered in the development of an e-Learning system, the issues that could be seen as a crisis if not addressed. This question consists of eleven (11) sub-questions aiming at addressing this research question. There are positive and significant responses from the participants with regard to this question. In the data collected, participants confirmed the kind of factors they expected to see when developing any e-Learning system that could be culture-oriented.

The factors to consider include: the generic nature of e-Learning system could be an added factor in the development as noted by the participants and the cultural elements (see section 5.2.3 - Discussion of the open-coding findings) in Chapter five (5). According to Alzaghoul (2002), the integration of culture makes the systems more culturally usable. These cultural

factors should be considered and applied, however, researchers like Lephalala and Makoe (2012), Epignosis (2014) and Mohammed and Mohan (2011), all believed that e-Learning system lacks culture and cultural factors, and it is seen as a challenge. The participants would also like to see e-Learning systems technologically adaptable and resources available. Likewise, the lack of learners' involvement is addressed to aid the designing process through consultation with the learners during design, development and the implementation stage. However, there are other factors to consider including system customisation (Garcia & Esteban, 2013). On the other hand, participants would like to see flexibility and usability considered at the design and planning phase of e-Learning system as well (Recker & Niehaves, 2008, Patrick & Barton, 2012). System content should also be considered among the factors in the design of e-Learning system as Sun et al. (2008) suggest. Lecturers' roles should be seen as a factor (Barik & Karforma, 2012) together with language, icons and symbols and support centres. Another factor is learning style as cited in Boondao et al., (2009). The participants want to see an e-Learning system that is more flexible, taking into account administrative factors, teachers/lecturers, AEF, content and other key elements in the development of e-Learning system that is culture-oriented. In all these, the social context that surrounds the learning environment should be understood and made accessible to learners and other stakeholders in order to ensure that other factors are effectively utilised.

7.3.2. How do cultural differences impact upon e-Learning design and implementation in SA?

From the problem statement in Chapter one, different cultures exist among the users of the e-Learning system; the question is structured into six (6) qualitative sub-questions seeking to understand how the cultural difference impact upon the design of the e-Learning system. Participants' expressions contributed to this question positively. Here are some of their contributions: the cultural difference impact upon e-Learning system design through usability, system language or language system (home language), representation of cultural symbols or icons which are all misrepresented in the current developments. Participants also believe that resources like time and money impact upon the design of the e-Learning system (PPT, 2009). Different learners' profiles impact upon the e-Learning system design and the managing of cultural and individual differences. Learner's acceptance of the e-Learning system, and religion, personal beliefs and communication also impact upon e-Learning design (Leidner & Kayworth, 2006). Managing these cultural differences can be challenging, especially the capture and representation of the cultural factors, resources and the challenges of language.

The inclusion of the e-Learning frameworks (see Figure 7.1) in practice assists in managing these differences. The data presentation includes analysis and discussion supported by existing literature on how cultural differences can impact upon the execution and implementation of e-Learning system.

7.3.3. How is culture captured in the development of e-Learning system?

Capturing of culture is a challenge as noted in the problem statement. This question helps to understand how culture fits into e-Learning development. Although, the question consists of six (6) sub-questions, according to Olaniran (2009), in general, the different language choices that could ultimately represent them is a challenge in the development. Participants believe that understanding and determining the system's usability, representing priorities and managing the cultural and individual difference in the development process are challenging.

Participants also urged for user involvement and consultation in delivering quality content in the design process to manage and capture culture in the development. Learner culture can be captured through the representation in content factors (see 5.2.3 - Discussion of the open-coding findings and Figure 7.1). Determining and presenting cultural symbols and icons can also be challenging, for instance, if developers used the en-ZA language (South Africa language) standard to represent language symbols in the design this approach would ensure that learners' cultures are captured. Participants also agree that managing and capturing culture is made possible through the use of familiar symbols and language known to learners. Achieving this rests on the consultation and involvement of learners in the development processes in order to understand their expectations, needs and inputs. Learners' inputs and ideas are generated through surveys, interviews and other means. To capture the culture, the participants felt that innovative and adaptive development methodology like Agile should be used to allow continuous changes and modifications in the development and post-development. Togaf could also be used to present and capture learner's cultural differences as indicated by participants. In contributing to lack of cultural elements, e-Learning developers and the participants in the study indicated that they never discuss learners' cultures among their team members while developing e-Learning system. The next discussion addresses the fourth part of the qualitative research question which deals with challenges that developers face in the development of conventional and culture-oriented e-Learning systems.

7.3.4. What are the challenges faced in the development of e-Learning systems?

Software crisis is an existing challenge in the field of software development for decades; and this question seeks to understand the challenges faced by respondents in the study when developing conventional as well as culture-oriented e-Learning system. This question is made up of five (5) sub-questions. Culture plays a major role in the development of e-Learning system (Mohammed & Mohan, 2011). Achieving these roles attracts challenges which are rooted in the determination of learners' priorities and expectations. Changes in technological gadgets were identified by participants as the major challenges. Also, a constraint in budgeting is regarded as one source of the problems in the development. These challenges facing e-Learning systems development cause problems attributed to increasing number of users in the e-Learning system. Other challenges include: managing resources in the area of human capacity, skills and expertise, time and money to design, develop and implement any system other than conventional e-Learning system; generic system which allows flexibility in customising e-Learning systems by adding features that impact upon learning effectively and removing those that limit the learning process.

Participants also attribute the problems to lack of a system that could handle the cultural setting and implementation, and the lack of infrastructure and equipment when designing a system in a different language. The developers and lecturers also lack culture orientation and user participation in the development process since the system lacks flexibility. These challenges are problems encountered in the development or customisation of e-Learning system in this study (see 5.2.3 - Discussion of the open-coding findings).

Addressing this problem on cultural differences means increasing the number of e-Learning usage, implementing fast development methodologies, developers and other stakeholders interacting with other universities, providing additional resources and listing clear objectives and deliverables requirements. However, the future of the e-Learning system remains promising and encouraging because quality outcomes stand to be improved and enhanced. This promising future could benefit the culture-oriented or learning system when developers and other stakeholder invest resources in it.

7.3.5. What are the challenges facing the current e-Learning system?

The design, implementation and use of e-Learning is confronted by different challenges such as lack of cultural orientation, collaboration and cultural factors which result in ineffective optimisation of e-Learning benefits. This question seeks to understand from the participants

(learners) the actual difficulties they face when using the e-Learning system. The question is made-up of eighteen (18) sub-questions. All the responses provided by the participants with respect to the question show that the mandate was achieved. Participants use e-Learning for different learning purposes and they face challenges that include:

- ✓ Lack of system customisation,
- ✓ Lack of direct consultation and engagement between developers and students,
- ✓ Out-dated contents, user-unfriendliness and unreliable network connection,
- ✓ Lack of cultural elements; users' knowledge, unfriendly use and interface.

The questions under this section have provided ways to address the challenges and provide a future path. The pathway identifies cultural elements that influence e-Learning, elements expected to be represented in any culture-oriented e-Learning system because they play an important role in the development and usage of the system. These elements effectively make learners understand the learning and the system content well.

There are several secondary sources that back up participants views and understanding of this question to which researchers like Dac and Bregman (2010), Arman (2010), García and Esteban (2013) all agree regarding the challenges confronting e-Learning. Patrick and Barton (2012) proposed the elimination of all these challenges for the e-Learning potentiality to shine. The question still remains to be answered regarding the recommendation from Wang et al. (2012) for collaboration and consultation between developers and learners (students) for the challenges to be bridged.

7.3.6. How can cultural-oriented e-Learning system be implemented to assist learners better?

The alignment of e-Learning with culture remains challenging and difficult. This question seeks to determine from learners on how e-Learning can be made culture-oriented. For a deep understanding by participants, the question consists of sixteen (16) sub-questions that provide an insight into how culture-oriented e-Learning could be made possible. Eight (8) out of the sixteen (16) sub-questions in this section concentrate on the break-up of different framework components validated in this study.

In order to implement an effective culture-oriented e-Learning system, respondents think that the system should be easily usable with little or no technical problem. Achieving this means implies improving upon infrastructure: quality internet connections and user-friendly interface taking place. The infrastructure would help users to use e-Learning and attend class more often

because conventional and culture-oriented e-Learning system supports and encourages participants in their individual studies and course work.

All the participants appreciate the need to consider the following adopted components: cultural, community, administrative, content, learning style and AEF on e-Learning design and implementation of the culture-oriented e-Learning system. In all these, 65.38% of the participants accept the fact that these factors play a major role in the execution and use of the culture-oriented e-Learning system. They also agree that the implementation of a culture-oriented e-Learning system involves teachers and lecturers who inject new ideas into the learning content that learners use. In summary, their positive insight truly confirms the view of researchers like Georgouli et al. (2008) and Blanchard et al. (2005) on the factors that promote culture-oriented e-Learning system, calling for the inclusion of all these factors in the design of e-Learning system. Their response demonstrates that the best way to serve learners (students) in the learning process is to consider their cultural values and concerns in the pre-design, post-design and also to add all these identified components or factors in the e-Learning system.

7.4. SUMMARY OF THE STUDY

The literature studies consulted for this study have revealed issues that relate to e-Learning, culture, framework and SDM, each of which plays an important part in strengthening this study with the aim of achieving its fundamental goal and objective. Olaniran (2009) believes that lack of culture causes challenges in the development of e-Learning. Patrick and Barton (2012) suggest that these challenges must be resolved for e-Learning to effectively deliver the needed service to learners. This study is rooted in the need to capture culture in the e-Learning system during development and post-development in order to make e-Learning system culture sensitive and user-friendly. All the summaries and the suggestions drawn from different participants in the study show a wide possibility for the development of a culture-oriented e-Learning system. This summary is based on the findings from section 7.3 above with some support from the literature studies.

7.4.1. The summary of the qualitative data

This study was carried out using MMR. The qualitative method (interview) was used to draw ideas from the e-Learning developers, and administrators as noted earlier. The interview questions were structured into five different sections consisting of 34 questions which provide

insight from the participant's knowledge of e-Learning, implementation, culture-oriented and framework. The followings are the findings drawn from the overall qualitative method:

- ✓ The impact of culture cannot be downplayed in the development of the e-Learning system as indicated in the literature and by participants. Majority of the conventional systems do not lay emphasis on learners' culture and background.
- ✓ The study suggested a lack of cultural features, factors and customisation which also impact upon the execution of the e-Learning system. The study was able to establish how culture impact upon the e-Learning system through technological integration, resources (human, time and cost), and increasing penetration and usages which impact negatively upon the design of e-Learning system.
- ✓ Learners are mainly the final users of the e-Learning system; then culture-oriented e-Learning system becomes more effective for achieving learning purpose. The study discovered that learners are not fully involved in the development decision and process, and that, the system is developer and lecturer-focused. This lack of learner involvement seems to account for the reason why their cultures are not captured in the system design.
- ✓ However, achieving culture-oriented e-Learning system is possible through flexibility, usability, simplified design plan, good quality content, language, symbols and icons. All these tools and features are paramount in culture-oriented e-Learning system.
- ✓ Content factors are important in the design of e-Learning system. The analysed primary data supports the literature on this importance, but the factor is established via quality content design, lecturers, academic support centres and others.
- ✓ Learning style is greatly empowered by making the system more flexible and understanding learners' individual choices and preferences.
- ✓ Another vital aspect of the e-Learning design is the administrative factor; the factor provides technical support, direction, evaluation and management.
- ✓ Also, this study demonstrated the importance of teachers/lecturer in the development in providing much-needed support, understanding and eliciting learner's needs and expectations. The needs are made possible through the system content.
- ✓ Cultural factors are critical in the design of e-Learning system; the factor lies in usability, language, resources and learner profiles. Though culture can negatively impact upon the e-Learning system, the primary (quantitative) data source revealed that some participants are not sure about the full impact upon the e-Learning system.

- ✓ Developers face challenges in capturing and managing cultural differences, and the finding shows that it would be difficult to manage and present cultural factors. In SA, the finding proves that there is no common language that is privileged for the e-Learning system. Participants revealed that managing cultural differences could be done through system usability, involving learners from the beginning of the system life-cycle, and delivering quality content. From all indications, the execution of culture-oriented e-Learning system demands flexible developmental methodology like Agile methodology and Togaf framework.
- ✓ From all indications, the principles and ideas of the adopted framework components and factors are viewed by participants as good tools to include in the development of a culture-oriented e-Learning system.

7.4.2. The summary of the quantitative data

The questionnaire consisted of 41 questions spread across three sections.. The questionnaire summaries are randomly selected across the second and third section, omitting biographic questions in the summary. The following are the summaries drawn from the quantitative method of this study:

- ✓ There are challenges in achieving culture-oriented design and implementation of e-Learning (Osterweil, 2011, Calvo et al., 2007). The challenges are attributed to lack of students' full awareness of the potential benefits of the e-Learning system design on home language and their studies.
- ✓ Many responses suggested English as an ideal language for e-Learning; these suggestions are against multiple opinions from researchers on the consideration of local language as part of the culture in the design of e-Learning. The data also supports the argument of Mohammed and Mohan (2011) which demonstrates that neglect of cultural factors in the design of e-Learning system is a contributory challenge to e-Learning.
- ✓ Among the fundamental elements of culture is language; in this study, the learning language is categorised into English, Home language (SA languages). Most of the respondents believed that both English and local languages should be used.
- ✓ The responses from the questionnaire indicate that e-Learning users prefer the design in both home and English language. This shows that the place of culture-oriented e-Learning system will be highly welcome in practice and in support of the literature that encourages culture-embedded e-Learning system (Mayes & de Freitas, 2004).

- ✓ Information and Communications Technology (ICT) is a promising mechanism to empower e-Learning processes connected to teaching and learning challenges (Dac & Bregman, 2010). The position of ICT on e-Learning cannot be underrated. The investigation identified that the participants (learners) agree that e-Learning powered by ICT is preferable compared to classroom teaching and learning. The preference of e-Learning can be associated with benefits that e-Learning adds to teaching and learning. The benefits are massive but not limited only to those articulated by Arman (2010), García and Esteban (2013) or Singh (2003). However, Patrick and Barton (2012) realise that these benefits have a bottleneck that should be removed for the potentiality to excel.
- ✓ There is a distinction between developers of the e-Learning system and the final users (Mohammed & Mohan, 2011; Osterweil, 2011; Calvo et al., 2007), but the reason for this gap is unclear to many. However, according to Mohammed and Mohan (2011), there is lack of cultural factors in the consideration of the design of e-Learning system (Olaniran, 2009).
- ✓ Wang et al. (2012) suggest theory(ies) that encourage consultation and collaboration between developers and learners; a suggestion that could remedy the gap and lack. This study revealed that e-Learning developers ignore engagement and consultation with the learners (users) when designing, developing, and implementing the e-Learning system. Respondents' suggestions support the existing literature that shows lack of consultation with learners during e-Learning design. In all these, the ideal solution lies with e-LSDF because of its potential to align different e-Learning factors lacking from e-Learning platform and engaging learners (students).
- ✓ The findings revealed that the e-Learning system lacks customisation features and tools which will allow users to add or drop and modify the system contents.
- ✓ Furthermore, there are different kinds of elements of culture that influence the usage of e-Learning, the investigation indicates that elements like religion, values/attributes, language, symbols, icons, communication and many more are the forces that influence the choice of learners using the e-Learning system. According to Blanchard et al. (2005), culture can be influential, but little study exists on its influence on e-Learning. The limited number of literature on the impact upon or influence of culture and its elements would be the reason why developers have ignored to engage or consult learners in order to understand the actual elements useful to them. Nonetheless, respondent's consideration of these elements proves their important to them and how influential they are in the overall

design and implementation of e-Learning system that enhances effective teaching and learning.

- ✓ According to Joy and Kolb (2009), cultural differences and beliefs impact upon learners' learning style and process. They also impact upon the ways of thinking and adopting e-Learning in education (Al-Tarawneh, 2012) and learning in society in general. Among the categories of the question, the survey shows that participants believe that culture influences learners to learner better, think well, understand well and answer questions well. By all indications, cultural factors and elements bring positive impact upon and influence to learners in the use of the e-Learning system. According to Caldwell (2011), learning culture includes attributes that encourage learners to develop attitudes, goals, values, and practice in the learning process.
- ✓ To Tsai and Machado (2002), e-Learning, distance learning and other learning platforms are encouraging and supportive of the learning process. However, the various respondents' indications imply that learners believe in the encouragement and super support received from e-Learning platforms in promoting effective learning. There are different platforms used in supporting e-Learning, among them is MOODLE (Despotović-Zrakić et al., 2012). MOODLE is one of the commonly used "open-source systems" approaches. As an open-source approach, it aims at promoting and making learning universal (FAO, 2011). To support the argument from the literature, the investigation shows that participants in the survey strongly believe that e-Learning assists in promoting favourable e-Learning experience and outcomes.
- ✓ The effort of Internet to affect teaching and learning is masked with challenges (Patrick & Barton, 2012). These challenges are felt in the e-Learning systems development in relation to the inability of developers to include learners' culture and experience in the design (Calvo et al., 2007). The leaders of ICT have tried to find solution (Sheypak et al., 2007), but the literature is full of many indications of the presence of challenges on e-Learning. The finding from the study reveal that learners (students) experience different kinds of challenges (issues) in e-Learning, on issues ranging from lack of cultural elements in e-Learning design to difficulties in finding reusable components as well as inadequate support tools (Arman, 2010; García & Esteban, 2013) which the investigation also implies that participants feel that e-Learning usage is challenging. Therefore, the proposed solution by Partnership with Higher Education in Africa (PHEA) aims to address all these educational and e-Learning challenges (Jaffer et al., 2007).

- ✓ An analysis undertaken by Oye et al. (2012) shows the current transformation in academic organisations increasing the usage of e-Learning tools believed to double soon in the near future. This literature highlights a promising future for e-Learning usage and application and the future can see more teaching and learning taking place in e-Learning with less classroom learning sessions. The investigation pointed out participants accepting that the future of e-Learning is very promising, a future to result in less classroom teaching and learning. This shows that the study was able to demonstrate that the future of e-Learning is promising.
- ✓ There are different kinds of factors and elements that potentially impact upon or influence the design and usage of e-Learning. Among the factors are cultural, community, administrative, student, content, teacher/lecturer, learning style and Activity/Exercise and static, individual, collective and dynamic culture. Different researchers believe in the inclusion of all these factors in e-Learning design in order to effect quality change in the e-Learning system as well in order to improve teaching and learning (Georgouli et al., 2008; Blanchard et al., 2005). However, according to Mohammed and Mohan (2011), the importance of these cultural influencing factors is very so much discarded when designing the e-Learning system. The investigation shows that participants agree to see these factors in their final e-Learning design. This proves that participants agree with many researchers on the need to add cultural factors in e-Learning design.

7.5. ALIGNMENT OF THE QUALITATIVE AND QUANTITATIVE FINDINGS

This section of the chapter presents the mixed results (qualitative and quantitative) which have been achieved through embedded/nested mixed method as indicated in chapter three of this study. The integration of the results is informed by the data collected, presented, analysed and discussed using different statistical tools and techniques.

Table 7.1 shows the contribution from both qualitative and quantitative findings. It also presents the components from both the qualitative and quantitative data source toward the design of the culture-oriented e-Learning framework. These components are picked from the mixed findings based on their level of impact upon the overall success of this study in delivering the culture-oriented e-Learning system.

Table 7.1: The alignment of qualitative and quantitative findings

Component	Qualitative data	Quantitative data	Both
Consultation, corporation and collaboration with stakeholder ✓ Lack of learners involvement ✓ Lack of cultural element ✓ Unfriendly to use ✓ Lack of users knowledge	X	X	X
Learners profile and Learners preference	X		
Resources (human, time and cost)	X	X	X
Usability – Design plan – Flexibility – Increase	X	X	X
SDM (fast development)	X		
Technology ✓ Changes and innovation ✓ Technical problem	X		
Content (system and material)	X	X	X
Cultural component ✓ Cultural factors – home language ✓ Cultural influence	X	X	X
Academic Support Centres (ASC) ✓ Direction	X		
Generic system – Diversification	X		
Customisation	X	X	X
Alliance with other institutions	X		

7.5.1. The formulation of e-LSDF from the transcribed data

This section discusses the combined validated framework components from Figure 1.4 in chapter one and the scientific findings from the qualitative and quantitative data which developers could apply when constructing the culture-oriented e-Learning system. Validation literally means that the final framework is based on the existing framework in Chapter one (Figure 1.4) and with supporting ideas from Hofstede's cultural dimension framework (see Figure 2.7 in Chapter two). Although, Figure 1.2 provides the standpoint for the framework validation, according to Mavetera (2013), a framework is a development made out of the scientific result. Importantly, it does not serve as “one size fits all” framework; rather it directs

any culture-oriented e-Learning system and software that could be developed. To effectively implement this framework in practice, the following must be considered:

- ✓ There must be a clear intention from the stakeholders to make the e-Learning system culture-oriented.
- ✓ The system or development problem must be explained through this framework.
- ✓ The development plan and process should link to this framework components and factors.
- ✓ The developers should use this framework to guide their activities, actions, ideas and knowledge.
- ✓ This framework provides a link to connect the entire stakeholders in the development cycle.
- ✓ The framework should anticipate the expected system outcome.

In accordance with this analysis, a framework can be seen as a concrete idea framed to guide the conventional or culture-oriented system from problem to solution. Purposefully, the underpinned rationale behind this validated framework is to develop a culture-oriented system. The framework is framed into seven (7) cycles with connecting arrows joining the cycles together. The seven (7) cycles represents "culture-oriented e-Learning system development framework (e-LSDF)". According to Kolås and Staupe (2004), the soul of e-Learning system implementation lies in its framework. Figure 7.1 below presents a culture-oriented e-Learning systems framework validated from Georgouli et al. (2008) and Blanchard et al. (2005) and is supported by Hofstede's cultural dimension (framework) to effect positive changes in teaching and learning from the problem to the solution as identified in chapter one. Back to chapter one, the problem statement (section 1.5) revealed gaps in the existing framework which mainly focus on the roles of culture in the design of IS platform without the mention of learners culture integration into the system. Besides, the development framework in Figure 7.1 resolves the gaps and provides the way forward in capturing the learner's culture in the e-Learning development process. Again, the validated e-Learning framework (Figure 7.1) consists of seven key cycles.

The researcher expects that the framework will help the e-Learning system developer, administrator and other stakeholders to design, implement and deliver a fully functional and effective culture-oriented e-Learning system. In addition, the framework makes e-Learning system easy and culture-oriented and closing the gap between the developers, teacher/lecturers and students. Once more, Figure 7.1 is arranged into seven cycles as presented at the right hand

of the screen (e.g. learning style). The framework is called the: Seven Cycle Culture-Oriented e-Learning System Framework (SCCOe-LSF). Each of the cycles consists of component(s) that guide the cycle; it means that at each stage, the developers must implement the detailed information regarding the component. A detailed discussion of each of the cycles is presented after the diagram:

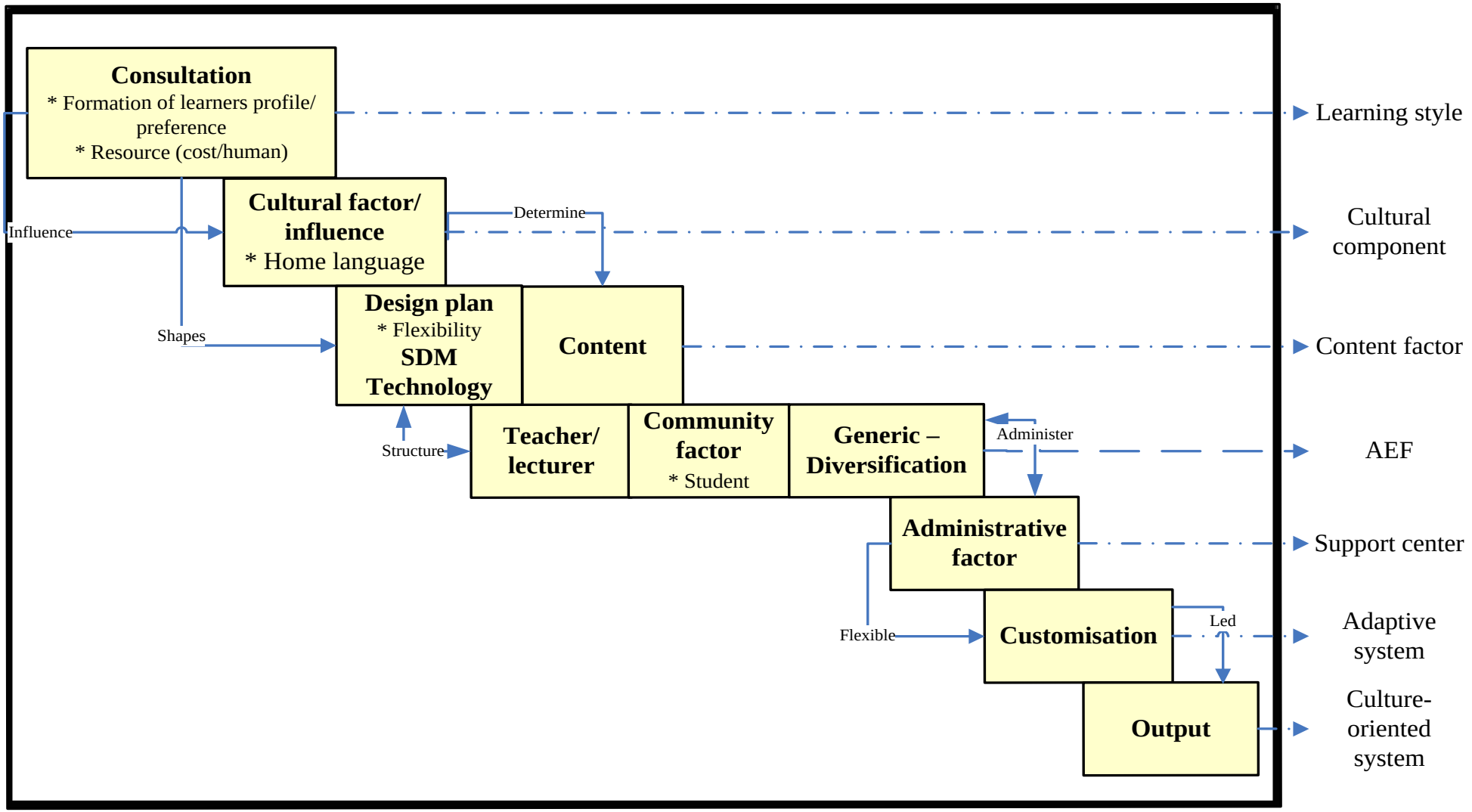


Figure 7.1: Seven Cycle Culture-Oriented e-Learning System Framework (SCCOe-LSF)

The highlight of the discussion on the cycles and components listed on Figure 7.1 is based on the fact that the cycles and components which emanate originally from the mixed methods data analysis and validated with the existing framework. Figure 7.1 comprises cycles arranged into components for the purposes of simplicity, usability and clarity for the developer.

- ✓ The first cycle to consider in the culture-oriented e-Learning development framework (Figure 7.1) is the **Learning style** of the learners; the cycle covers the consultation (formation of learners profile/preference and resources (cost/human)). As seen in chapter one, learning style entails demands, needs, expectation and personal experience of the learners and is covered in dialectic modes. The necessity of this learning style lies in diverging, assimilating, converging and accommodating learners across the learning spectrum. This expectations and needs in the e-Learning system are gathered by the developers and the development team members through the ***consultation*** process with the stakeholders especially by engaging the students using interview, survey and other data gathering techniques. Culture-oriented e-Learning system can only be made possible through consultation which assists developers to gather and understand learners' views, needs, expectations and input into the development plan. The reader applies the consultation process in the framework for the purpose of eliciting quality data from users. However, the consultation also helps to formulate and understand learners' profile and preference (formation of learner ***profile*** and ***preference***). The connection among the stakeholders is paramount as noted in the important point of consideration about the framework. The section (5.2.3.1) in chapter five presented consultation with students in the development cycle. Nonetheless, learners profile involves gathering that specific information which defines the individual in the teaching-learning process and also understanding their expectations and other personal attributes about them, while the learners preference covers the favourite that works to the advantage of the learner. These attributes are captured and analysed in the early planning cycle of the development. However, the developers' team in order to choose suitable data gathering techniques to use in understanding these learner profiles and the preference through the consultation process in order to be acquainted with the learners learning style. Again, it was recorded that the cycle would help in mitigating the lack of learners' involvement in the development, lack of learners (users) knowledge in the design and unfriendly e-Learning system design and others that stand as a hindrance.

However, the consultation is made possible through the availability of a **resource (human, cost and time**). The level of the resources available to developers determines the success of the culture-oriented system as noted in the analysis. This cycle influences the second cycle called cultural component.

- ✓ **Cultural component:** This is the second cycle in the e-Learning framework as noted on the qualitative and quantitative data summary; it covers cultural factor/influence (home language). The cycle involves cultural values and factors which impact upon or influence the learning wellbeing of a learner and also in determining the success and the failure of the system. This cycle shields the ***cultural factors/influence*** of the learner. In order to achieve this cycle, it demands the developer to factor in individual learner cultural identity like home language, symbols, icons, signs and others which can be a selling point in the development. Also, this cycle goes with the understanding that the influence of the cultural component and the impact upon it has on learners and the amount of value attached to each factor and influence. However, the influence can be captured during the consultation process. In fact, this cycle is considered because learners are comfortable to have their identity attached to the learning system. Nonetheless, the cultural component as a cycle assists in determining the third cycle known as the content factors.
- ✓ **Content factors:** As noted in chapter one, this cycle ensures that a quality e-Learning system is designed (Sun et al. 2008). Content factors involve those materials that influence the learning process and satisfaction like a study guide, textbook, hand-out, journals, magazine and many more. They cover the design plan (flexibility), SDM, technology and content. The content of e-Learning system is vital to the learners (users) because it is a point of interaction and engagement for them in the system. The system content is user friendly and helps to eliminate issues like lack of user's knowledge as a result of the consultation with the learners. The cycle is validated and enabled by the ***design plan, system development methodology (DPSDM) and technology***. Each of these helps to present the much-expected culture-oriented e-Learning content to learners. Here is the discussion of the cycle components as applied in practice.

  The ***design plan***: The execution of the content factors begins with this component where the learner's expectation and needs are captured in the first cycle of architecture in the form of a diagram (drawing) or in a written form. The component shows the system layout plan and how data and information flow from one point of the system to another. It also shows the interaction and links with other cycles in achieving the culture-oriented e-Learning system. Through this component, the full structure and architectural design of

the system is articulated from every angle. The component is accompanied by SDM. ***SDM***: The component is seen as a tool to assist in the execution of a workable system including the e-Learning system. This component is used in the development as building blocks that ensure that learners style, contents and cultural components are enshrined into a good design move into execution or implementation of a usable culture-oriented e-Learning system. At this level, the usable SDM are structured, agile and object-oriented methodology. However, the chosen methodology is confirmed with the knowledge of the developers' team, design plan, resources and time available in the development. This component is paramount in delivering quality content to the users and is compatible with technology.

Technology: The content factor goes with technology which empowers the e-Learning system because the SDM is embedded in technology for effective usage and functionality. The literature study in chapter two revealed that technology can increase or improve learning usage (Lee, 2013). The literature also suggests that the rapidly changing world of technology must be articulated in the design planning for a better content. It also helps to streamline the gap between the framework and learning content. The content factors determines the application of technology in the design of the e-Learning system as well as understanding the nature of technological gadgets and platforms used by learners and their technological level of knowledge. To achieve this, the technological consideration should be determined at the consultation cycle when designing the e-Learning system, because technology is a flexible and institutional infrastructural changer. At this point, e-Learning design should be technology-oriented or centred. This discussion continues on AEF cycle as seen in the next section.

- ✓ **AEF**: The management of each learner's academic work is handled by AEF (Georgouli et al., 2008); the process involves downloading, uploading learning materials and others. This cycle brings learning contents closer to users. For validation reasons, the cycle covers the following components: teacher/lecturer, community factor (student), and generic (diversification). The study adopted a cycle from the literature section in chapter one and these components were added as suggested from the collected mixed method data. The role of a ***teacher/lecturer*** in this cycle is to gather detailed input from the learners and harness them in designing the planning level. Also, the literature indicated that most components are very important and intermediary between the learners and other stakeholders (Georgouli et al., 2008; CCSESA, 2011). This means that this component streamlines the effort of AEF effectively in linking community factor in designing the e-

Learning system. ***Community factor*** handles the communication, collaboration and dissemination among learners (Georgouli et al., 2008). Readers and developers should realise the need to consider this component in line with AEF cycle the in the design of e-Learning system as articulated in the mixed data interpreted. Also, community factor engages with the students as they are final users of the e-Learning system in practice. Based on the importance of the community factor, the component is validated in line with its roles in presenting different platforms and also learners can use it to engage with others and this can be culturally presented as well. Again, ***students*** are the final users of the e-Learning system. The inclusion of students in the AEF cycle helps in supplying the much-needed cultural information and the expectations of the learners themselves. As noted in chapter one (the features of AEF), only the developers understand the suitable features and this has cultural influence in the design. Based on the important roles played by students, the developers and other stakeholders should consider their views, needs and expectations. Again, the AEF features must be ***generic (diversification)*** in handling the culture-oriented e-Learning system design. This generic aspect of the features will also be diversified to learners across the different cultural backgrounds as they are also accommodated allowing features customisation. The developers feel the ability to make the e-Learning system features generic brings diversification in the system design which carries along all learners. The more generic and diversified the e-Learning features can be, the more achievable culture-oriented the e-Learning system can be. In fact, the AEF operative power and functionality rests on the support centres across the learning process.

- ✓ **Support centre**: This cycle deals with services provided by support centres across educational institutions; the services cannot be underrated because they help AEF function effectively in the culture-oriented e-Learning system delivery. Their service coordinates from the operation of the learning style, cultural component, content factors and AEF cycle in achieving a culture-oriented system. For example, the support centre assists in elicitation learners' expectations and needs, facilitating and maintaining the relationship between the teacher/lecturer and the students. This service involves the duty of the administrator as a component. ***Administrative factor*** includes the administrators such as the managers, mentors, policymakers and others as proven by the literature study and supported by the participants. Their services and duties are backed by the support centre ensuring continuous functionality of the e-Learning system. The consideration of the culture-oriented system counts as basic, because it's an important role player and also the duties of the administrators are understood. The developers consider the knowledge of the

administrator factors in the design as a result of their ability to document the e-course that portrays learner culture and supplies important information to the developers. The support centre cycle is effective when working with an adaptive system (customisation) cycle.

- ✓ **Adaptive system**: This cycle deals with the flexibility of the e-Learning system with regard to culture. Conventional e-Learning system can be implemented with the adaptive-mindedness in order to satisfy learners across all learning and cultural backgrounds. The adaptive nature of the system is tailored to the AEF cycle and content factors. The adaptive system cycle is housed in the customisation. Through ***customisation***, learners are allowed the choice to alter the conventional e-Learning system or customising the system features to suit one's expectations and needs in the learning process. However, according to Nedeva, Dimova and Dineva (2010), the e-Learning system lacks customisation. As a result of the lack, customisation of the e-Learning system is evitable to fit the culture-oriented e-Learning. Progressively, the developers consider this cycle in order to deliver culture-oriented e-Learning as the final culture-oriented system (outcome).
- ✓ **Culture-oriented system**: This cycle focuses on achieving the main purpose of the framework together with the system. The expectations of all these cycles and components are discussed in this validated framework in to order direct and accomplish workable culture-oriented e-Learning that delivers advanced teaching and learning boundless. System ***output*** is the component of the cycle but not the least, an output which propels the idea behind every component and cycle of this study. To achieve the needed output or outcome of this study, the developers need to think in line with the cycles in this framework in an effort to deliver culture-oriented output. In summary, the application and implementation of all these cycles and components into the design of the e-Learning system will surely deliver desired culture-oriented e-Learning system outcome.

7.6. LIMITATIONS OF THE STUDY

Against the mandate of information system discipline, limitations are always felt on research study as seen in this study (Mavetera, 2011). Here are major limitations experienced on this study from the beginning but not exhaustive and not applicable to other thesis:

- ✓ There are different kinds of e-Learning platform available as shown in chapter two, but this study is limited to the ones discussed in this study.

- ✓ There are different forms of e-Learning theories existing, but the Constructivism, Behaviourism and Cognitivism are popularly used, and this study only focus on these three because of the detailed work provided in chapter two.
- ✓ Among the limitation experienced on this study was that most of the interviewees don't know anything on the integration of learners culture on e-Learning system development.
- ✓ They (many of the participants) had no idea on the possibility of developing culture-oriented e-Learning system or its framework. This was challenging to this study because they couldn't relate culture, learners culture and e-Learning system.
- ✓ This study is limited to sample from three universities, resulting in a financial limitation.
- ✓ Conducting similar studies with different institutions may add new results involving culture-oriented components and factors.
- ✓ Some of the participants involved in this study, did not know much about culture in the e-Learning system development and others were busy completing the questionnaires while others did not make it to be interviewed verbally or to complete a given written-format interview.
- ✓ In addition, the study was compiled based on the ideas and perception of the participants which could be subjective and restrictive in generalizability.
- ✓ As a result of distance problems and financial restrictions, more than randomly selected 20 written interviews were sent across different institutions and the majority did not reply to the message at all.

7.7. VALIDATION OF THE STUDY FINDINGS

Research validity is an indication that the right processes have been used to find answers to the research questions while reliability means the repeatability and accuracy of the study (Kothari, 1985). The validation in mixed research methods is always complex and challenging; this complexity is also related to the problem of representation and legitimisation of the results (Onwuegbuzie & Johnson, 2006). To this study, the mixed methods research led to a shortfall in the qualitative and quantitative approved and the application of its findings solely depends on validity. However, the multifariousness of a research method can be regarded as its main strength to IS research (Venkatesh, Brown & Bala, 2013).

Validity is the focus point of qualitative and quantitative research (Welman et al., 2006; Cohen, Manion & Morrison, 2007). As Johnson, Onwuegbuzie and Turner (2007) put it, the trustworthiness, validity and credibility of mixed research are vital in any research. The

trustworthiness and rigorousness of mixed research methods are challenged (Collins, Onwuegbuzie & Jiao, 2007). However, the issue of trustworthiness and rigorousness has been questioned in a discipline like education, administration, counselling and social work (Merriam, 1995). To this study, the aim of validity is to build up confident and interpretive research findings into practice. However, the identity of respondents must be protected at all cost, but difficult (David & Sutton, 2004). To ensure validity, the researcher's questions like, "Can the same result be obtained by somebody else? How to determine if the results were not biased or the researcher influenced the actual results? How to determine whether the right data gathering and analysis tools were deployed?" and many more raise a fear on the rigour and relevance relating to academic research (Merriam, 1995). To overcome all these and other issues, the study used an appropriate methodology, approaches, design, analysis tools, in measuring what needed to be measured in formulating the Seven cycles culture-oriented e-Learning system framework (SCCOe-LSF) (Figure 7.1). The framework recognises cultural validity because cultural validity seeks and recognises the culture of those researched (Cohen et al., 2007). This means that the validated framework in Figure 7.1 renders effective learning process.

7.7.1. Validity applied in the study

Validity is an important principle to research including mixed research methods, meaning that invalid research is meaningless or worthless (Cohen et al, 2007). Research validity can be seen in different ways. It consists of internal, external, content, cultural, descriptive, interpretive, evaluative, theoretical validity, construct and so on (Cohen et al., 2007). Likewise, according to this study, the validity of a research is expressed in its ability to deliver a product that can be agreeable within a given environment (Sarantakos, 1998). Also, it shows in the "honesty and genuineness" of the data found (Anderson, 2010). It can be said that validity is the strength of any research findings; it focuses on whether the finding is accurate from the viewpoint of the researcher, user and participants (Creswell, 2009; Sarantakos, 1998).

Validity is also achieved through trustworthiness, research richness, research boundary and research objectives achieved (Cohen et al., 2007). On this point, validity can be seen as "trustworthiness, credibility and authenticity" of a study (Sarantakos, 1998). The validity of research findings depends on the level of the study and its truthfulness to measure and represent the context it proposed to represent, attending to the study objectives and goals, as applied to this study. Figure 7.2 is an indication of how validity was applied and used in this study to ensure that the presentations and findings are validated, credible, reliable, rigorous, trustworthy

and relevant to the discipline. The validity consists of the following principles: research guide, paradigm and integrative validation.

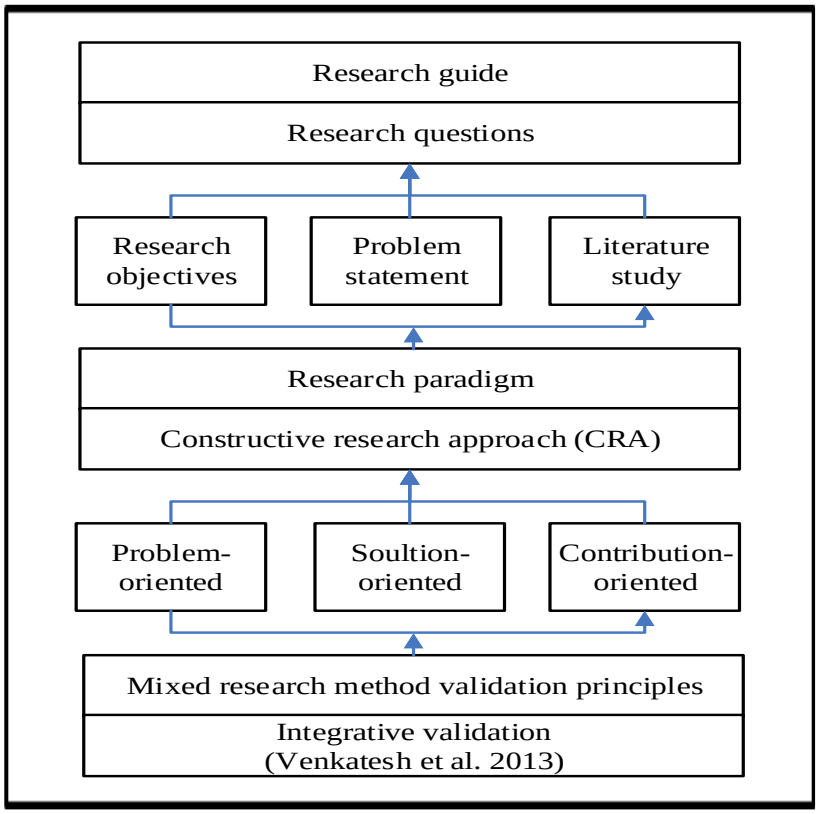


Figure 7.2: Validity applied (*adapted from Rautiainen et al. (2014), Lukka (2001)*)

The researcher called the first validity principles research guide; which comprises research questions set in alignment with the research objectives, problem statement, literature studies and significance of the study. The validity of this study has been achieved using literature studies and existing ideas in order to support the interpretation and findings as well as applying mixed research methods. According to Collins, Onwuegbuzie and Jiao (2007), the mixed method helps to gather enough rich data to increase the validity (descriptive and interpretive) and generalising the findings to the wider audience. MMR help to increase the validity of research results based on the methodological procedures applied (Bazeley, 2002). This researcher conducted a pilot study to validate the research questions in practice before the final questions were approved by the supervisors. The second principle is based on constructive research paradigm (CRP) used in the study and which is problem-oriented (understanding lack of culture in the implementation of e-Learning system), solution-oriented (formulating a culture-oriented e-Learning framework to resolve the problem), contribution-oriented (adding

knowledge to the development of e-Learning and on the IS discipline) and has industrial relevance.

According to Venkatesh et al. (2013), IS researchers need to discuss the results validation from the beginning of MMR. Through validation, research threats and risks are minimised, since the research needs to provide how the threats are addressed. Research validation follows generally accepted processes and principles in establishing research objectives. In this study, the researcher deployed the principle and process shown in Figure 7.2 and Table 7.2 to ensure that the integrative quality validation in the study is generally maintained. The table was adopted with the rationale that it presents the procedures as pioneered by Teddlies and Tashakkori (2003; 2009) for an accepted standard validation principle for MMR in IS discipline. The components of the table were followed to ensure that the findings and procedures are valid and applicable in the IS discipline.

Table 7.2: Integrative validation (*adapted from Venkatesh et al., 2013*)

Quality characteristic	Quality standard	Description
***Design quality*: To answer the research questions, the researcher chooses the most desired tools and processes**	Appropriate/desired design	Determining whether the chosen research method and design are appropriate in responding to the research questions. For instance, in this study, the researcher used embedded design focused on the interview (qualitative) and questionnaire (quantitative) research instrument.
	"Design adequacy"	*Qualitative*: Ensuring the right research design tools and processes are applied (embedded/nested mixed design) (Terrell 2012; Creswell 2006).
		Quantitative: Ensuring the right quantitative design tools were deployed (embedded/nested mixed design) (Terrell 2012; Creswell 2006).
	"Analytic adequacy"	*Qualitative*: The use of adequate data analysis processes in answering the research question, see (Table 4.3) Creswell (2008) and qualitative analysis (5.2.2) (Ellsberg & Heise, 2005).
		Quantitative: Using the right and accepted data analysis processes in delivering the adequate answer to the research question (see Table 4.3) Creswell (2008).
***Explanation quality*: The process credible results were interpreted**	Qualitative conclusions	The researcher using interpretative mechanisms on the findings of which are relevant, consistent and conclusive in alignment with secondary ideas (theories). Chapter five of the study is a proof of the qualitative data conclusive process.
	Quantitative conclusions	The interpretation from the quantitative method in close association with the appropriate data finding model (see Table 4.3) and (section 6.6 in Chapter six)

	Meta-conclusion	*Integrate effectively*: It ensures that the mixed method data findings are correctly integrated (see 7.5) in chapter seven of the study.
		Data "transferability: The level at which meta-conclusions from the mixed data findings can be generalised in the discipline.
		Integrative agreement: The level at which meta-conclusion from the mixed research method meets the purpose of the study.

7.8. CONTRIBUTIONS TO BODY OF KNOWLEDGE

The research process at the level of PhD is a very long one filled with interactive and systematic learning process (Mavetera, 2011). The process is informed by a research problem identified. For it to be interactive and systematic, a research methodological process must be followed and be rooted on a theoretical and conceptual framework. The processes and steps deployed in a thesis must be sequential, connecting from one step to another. The entire processes directs to the framework generation.

Importantly, there is a need to ascertain if the thesis is making good progress or not in advancing knowledge in the study under investigation (Introna, 1992). Then, a researcher should be innovative identifying a research topic that impacts upon and delivers solutions or suggestions in the academic field. Achieving the main objectives of the thesis means that special attention must be paid to the construction on the entire argument. According to Introna (1992) "a substantial contribution to knowledge in a field of study should not be used as the sole criterion and should not be a priority." An evaluation process of a thesis is "less valuable than the process" deployed in conducting and documenting the research study. These processes if properly deployed ensure rigorous learning and understanding of the context under study. The master contribution in this thesis is seen in the creation of a culture-oriented e-Learning system framework to assist developers and administrators. The framework helps in addressing the lack of learners culture on e-Learning system during development and post-development.

7.8.1. Generated framework evaluation (GFE)

The Figure 7.2 (section 7.7.1) highlights the evaluation principles used in this study. The principles are in line with Introna (1992) and Mavetera (2011) where evaluation questions were applied in this study and the field of Information Systems at large. The contributions are:

1. **Was the research problem addressed towards a continuing question(s) in the discipline and the study?**

A lot of research studies have been done in the area of software development and its crisis particularly on e-Learning system development. Nonetheless, few or no research studies have been done on culture-oriented e-Learning system development framework (see Problem statement). Software crisis that have persisted for decades are likely to continue in the near future. The focus area of this research problem as addressed in this study helps to produce quality outcomes of e-Learning systems, developed most especially in the area of inclusion of learners' culture in the development. The problem identified different kinds of frameworks, methodologies, approaches and models used in developing e-Learning systems and their gaps: this research study has addressed that by adding culture-oriented e-Learning systems framework.

This research study proposed standardised culture-oriented e-Learning system development framework that would be able to address lack of learners' culture in the development of e-Learning system. The following research questions have been addressed in this study:

- ✓ *What are the factors that should be considered when designing an e-Learning System (e-LS)?*

This question seeks to understand (cultural) factor and issues to be considered and those not considered in e-Learning development and the crisis in the field. The frameworks, methodologies and models discussed in Chapter 2 have not captured culture-oriented e-Learning system factors. Nonetheless, the Section 7.3 discussed in detail these factors which the participants would like to see in the development of culture-oriented e-Learning system (see Figure 7.1). From all indications, the question is answered.

- ✓ *How do cultural differences impact upon e-Learning system design and implementation in SA?*

From the problem statement, different cultures exist among the users of the e-Learning system; the question seeks to understand how the cultural difference impact upon the design and implementation of e-Learning system. The different cultural impact upon the development can be felt across system usability, learning language, symbols and icons. Also learners learning style and profile impact upon the development of e-Learning systems. This study framework provided the aspect in managing the cultural impact through consultation (Figure 7.1).

- ✓ *How is culture captured in the development of e-Learning system?*

Capturing of culture is a challenge as referenced in the problem statement. This question was addressed in Chapter 2 in discussing the lack of capturing culture on e-Learning system and Chapter 3. Figure 7.1 shows a standardised framework to be followed in capturing culture in the development.

- ✓ *What are the challenges faced in the development of e-Learning systems?*

Software crisis has been an existing challenge in the field of software development for decades. Section 7.3.4 boldly stated and addressed different kinds of challenges inherited in the development of culture-oriented e-Learning system and also on conventional e-Learning system.

- ✓ *What are the challenges facing the current e-Learning system?*

The design, implementation and usage of e-Learning is confronted with different challenges which result in ineffective optimisation of e-Learning benefits by the users. Then, this question seeks to understand the real challenges students face in using e-Learning system users. This question was addressed in Chapter six (6) (Section 6.5.1.1) and Section 7.3.5 of the study.

- ✓ *How can culture-orientated e-Learning system be implemented to assist learners better?*

The alignment of e-Learning with culture remains challenging. The implementation and execution of culture-oriented e-Learning system can be done through the process discussed in Section 7.3.6, 7.5.1 and the use of "Seven cycle culture-oriented e-Learning system framework" (SCCOe-LSF) (Figure 7.1).

2. Is a suitable method of enquiry used?

Carrying out scientific research follows standardised, appropriate and systematic research methods that allow for the acceptance or the rejection of findings. According to Mavetera (2011), research method of enquiry is interlinked with theoretical and methodological applications. Before CRA was selected for this study, the discussion in Chapter 1 and 2 was clarified and reality of the problem statement was taken into consideration. Chapter 3 also allowed the researcher to gain more insight into the conceptual map (see Section 3.21) informing the choice of research method that resulted in embedded/nested design. The design was streamlined to mixed research methods. Chapter 4 also allowed the discussion on other applicable research designs applied in this study. This assisted the researcher to make a

concrete decision on the research approach and design used. As the study focused on the development of culture-oriented e-Learning framework, CRA became the preferred design which was made possible through mixed methods. As discussed in Chapter 3, CRA is an ideal design in the development of culture-oriented e-Learning framework through embedded design.

3. **Is the method used in data analysis suitable and in alignment with the method selected?**

Data analysis processes and steps followed are of paramount importance in that they allow transparency on the data analysis method. The merging of automated analysis software's and tools like Atlas Ti used in this study consolidated the research processes. The presentation on hardcopy the axial coding and full comparative methods featured in the tools repository may demand a lot of patience in deciphering meanings but they make a plausible presentation of the actual sorting and coding of the data generated in this study. Due to the advancement in technology, the omitted coding's are stored in the soft-copy annexure and allowing only the major findings in this study to be included in the main document. This decision was supported by Mavetera (2011) who stated that only vital data in the form of summary findings should be included in the main research document; the rest could be attached in the annexures.

4. **Has the framework amalgamate different, preciously unrelated problems or concepts (Introna, 1992)?**

As indicated in Chapter 1 and 2, some organisational frameworks, dimensions and problems were discussed. For example, the research problem tackled lack of culture-oriented e-Learning system, culture-oriented e-Learning framework, methodology, model, capturing learners culture, lack of customisation of e-Learning system and learners involvement in the decision making in the development. The problem also involves lack of cultural presence on e-Learning system. The software crisis which has persisted for decades still continues. The introduction of culture-oriented e-Learning framework "Seven cycle culture-oriented e-Learning system framework (SCCOe-LSF)" can be regarded as the ultimate refinement toward addressing these problems. The framework has amalgamated different and previously unrelated concepts.

5. **Has the framework created new viewpoints on the existing problem?**

Conventionally, the issues that commonly address why software crisis persists have not been fully addressed in previous studies. The research questions discussed and addressed in this

study centre on capturing learner's culture on e-Learning system. The issues were addressed in this thesis. Finally, this study addressed the problem on why learners' cultures are not captured and how these can be represented in the overall development of e-Learning system. The inclusion of learner's culture has to be addressed from the beginning of the planning through to the implementation of the e-Learning system platform. Such a framework will improve the capturing of learners' cultures on e-Learning system.

As an interpretive study rooted on CRA, there is a new view or perspective produced about the existing problem of many of the e-Learning system development issues currently confronting e-Learning system development which have been addressed. Examples of such issues addressed are the following:

- ✓ What are the factors that should be considered when designing an e-Learning System (e-LS)?
- ✓ How do cultural differences impact upon e-Learning system design and implementation in SA?
- ✓ How is culture captured in the development of e-Learning system?
- ✓ What are the challenges faced in the development of e-Learning systems?
- ✓ What are the challenges facing the current e-Learning system?
- ✓ How can culture-orientated e-Learning system be implemented to assist learners better?

All these questions that emerged from the research problem statement and have been addressed in Chapter 5, 6 through to 7 and the formation and the development of culture-oriented e-Learning system (see Figure 7.1).

6. Has the framework created unusual ideas?

As deliberated in Section 7.5.1, Introna (1992) states that research ideas should be radical and ambitious. Frameworks have been used in information systems development before but, nonetheless, no one had tried to implement any in the execution of culture-oriented e-Learning system as this study has done. If this study had failed to understand and explore frameworks, methodologies and models used in the system development, then, the characteristics and attributes of the framework formulated in this study would not have been possible. The exploration has produced culture-oriented e-Learning system framework that will improve the development of e-Learning system (Section 7.5.1). Finally, this study achieved a standardised and creative framework to enhance the development of conventional e-Learning systems and culture-oriented e-Learning system.

7. **The framework must display "positive and negative heuristic power" (Mavetera, 2011; Introna, 1992).**

This section of the evaluation enables the e-Learning system developers to solve the development issues. The negative heuristic power is viewed in the following manner:

- ✓ New framework, methodology or model is not needed. The present frameworks are not effective enough.
- ✓ The learners' cultures are not captured in the development of e-Learning system

The positive heuristic power are viewed in the following ways:

- ✓ There is a need for enhancing the execution of information system research and development through the introduction of culture-oriented e-Learning system framework.
- ✓ Framework offers great potential in the enhancement of development, implementation and evaluation of e-Learning system. The positive heuristic power have been addressed to counter the negative aspect.

8. **Is there enough study of the appropriate literature?**

It was evidently noted that research study at this level must be rooted in relevant literature (Mavetera, 2011), with a focus in the area of system and e-Learning system development (see Chapter 2 and Figure 3.1). Looking at the main focus area of this study, the information systems, system development methodologies and education, measuring comprehensive and relevant literature were accomplished in this study. The challenges can be attributed to the diversity of the research area from continent, nation, and to a discipline. Meanwhile, the use of e-Learning platform to aid teaching and learning is pretty much an emerging idea and the integration between technology and education is still viewed differently by many people. Much more on the integration of culture or learners' culture with e-Learning still needs to be researched into. So, the appropriate use of literature can be measured from these different challenges.

Based on this, the quantification of relevant literature in any academic research can hardly be accurate nor successful. The challenge is increased because this study covered information systems, learners' culture and the education discipline. Judging from this, it can be misleading to search for relevant literature across the range covered in this study from one particular discipline to the other. The only way to judge the depth and breadth of the literature sourced in

this academic research is to acknowledge that the debate is not exhaustible in one single thesis. This implies that a single research study literature is not exhaustive in nature.

Nonetheless, this study could be adjudged on the basis that all the research problem had a literature review that is relevant to support or reject the existence of the problem. The questions in the research problem and the nature of the problem, the reasons for the problem and the ways to tackle the problem are the major determinants of the literature reviewed in this study. In sum, the focus area of this study, the literature accessibility and availability of sources and the duration of the study also determined the validity and scope of the literature. So, the relevance of the literature draws ideas and discussion and criticism from various areas both on the conceptual, theoretical and methodological levels. Then, the research problem and objectives were addressed and effective contributions were made.

7.9. SUGGESTIONS FOR FUTURE STUDY

Academic research at the level of thesis demands a lot of preparation. Information systems is a discipline whose development affects every aspect of life and society at large. Based on the nature of the discipline, the method, process, framework developed in this study, there is need for advancement and fine-tuning of the concepts developed and integrated into the current proposal. For the continuous improvement and advancement of the framework presented here, the following research could be done in future:

- ✓ E-Learning system should allow the use of different languages in SA with customisation features. Customisation is supported by Garcia and Esteban (2013), who believe in the benefits and application in the development of e-Learning system.
- ✓ E-Learning should be generic in the learning process to protect our climate. This can be achieved by reducing paperwork in the learning process with more focus on e-learning system.
- ✓ There should be proactive collaboration and co-operation between the developer(s) and the learners (students) and consideration of SDM to include other stakeholders in the ultimate promotion of this collaboration. This active collaboration is in line with the view of Wang et al. (2012), who suggest consultation and collaboration between developers and learners. The suggestion could bridge the gap and lack of culture in the design of e-Learning system.
- ✓ Developer(s) should always consult learners and lecturers (teachers) in future before the commencement of e-Learning design and implementation.

- ✓ Developers should always consider SDM that encourages collaboration among stakeholders (e.g. Agile methodology).
- ✓ All the influencing cultural elements and factors should be considered in the design of e-Learning and also, e-Learning system should be made user-friendly in order to promote effective and efficient e-Learning learning processes.
- ✓ All the identified factors or components in this study should be integrated into e-Learning design and development.
- ✓ The "*social and cultural factors (SCF)*" discovered in this study can be tested to determine their relationship with Hofstede's dimensions.

7.10. CHAPTER SUMMARY

The chapter presented a summary of the entire report from Chapters from one to six in relation to the research questions and objectives. The research questions were answered showing that many of the participants agreed on the culture-oriented e-Learning system while others were not sure of the benefits of a culturally influenced e-Learning system. Participants' inputs and ideas are backed up directly by existing literature studies in the discipline of this study. Each of the research questions has been answered and addressed by describing, categorising and evaluating the research participant's responses.

In sum, the limitations in this can be turned into strengths and opportunities in the future: the major contribution could be achieved when the developers and other stakeholders that intend to use this framework apply it to the development process. The application would work out successfully if it follows standardised validation principles in the formulation of the framework so that its validity and reliability can be guaranteed in delivering a fully functional culture-oriented system that accommodates learners across different cultural backgrounds and ethnicities. To recap, this balanced framework was developed due to ideas and input from developers, e-Learning facilitators and students with make future e-Learning development learner-oriented and addressing the long standing software crisis and development needs.

The new framework will assist to accommodate learners' culture differences that can be applied in the development and implementation of culture-oriented e-Learning system. Also, this e-Learning framework will help in achieving a desired teaching and learning purpose and needs.

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ANNEXURES A: INTERVIEW QUESTIONS

INTERVIEW DEVELOPMENT TABLE OF MATRIX	DURATION
Introduction (Section begins – interviewer runs introduction)	**10 min.**
✓ Introduce the purpose of the interview and the expected outcomes. ✓ Introduction of the research objectives. ✓ Explain the confidentiality of the respondent data and the interview contents.	
Discussions topics	**75 min.**
Section A: Biographic questions:	**5 min**
✓ Gender: _____ ✓ Age group ☐ 15-25 ☐ 25-35 ☐ 35-45 ☐ 45-60 ✓ Race group Black ☐ White ☐ Coloured ☐ or Asian ☐ ✓ Line of job/position: _____ ✓ Home language, institution and department/section: _____ ✓ Number of years worked in the institution: _____	
Section B: What are the factors that should be considered when designing the e-Learning System (e-LS)?	25 min
1. Do you think culture has an impact upon e-Learning ("borderless virtual learning with use of multi-media technologies") development? If so, • How does it impact upon? **2.** In what ways do you think students' cultures contribute to the development of e-Learning system? **3.** Have you ever consulted students (users) while developing any e-Learning system? If so • How do you engage with students in capturing their cultural expectations when developing e-Learning system? • If not, why are you not engaging with them? **4.** What aspect of students' culture have you shown, recognised or captured on e-Learning system development? **5.** What do you think are the cultural factors (like what learners see, feel and understand using symbols and others) that should be considered when designing e-Learning? name them **6.** How do you represent content factors (example textbook, hand-out, study guide, journals, and magazine) in the development of e-Learning system and its important? **7.** Learning style (experiences, needs, demands and expectations), assist students to remain focused in the learning field: how would integrate these styles into the cultural-oriented e-Learning system? • Why is it difficult in capturing learning style in the design of e-Learning? **8.** What do you think is the importance of administrative factors (mentors, IT manager) in the development of e-Learning system? **9.** What are the roles of teachers/lecturers in the design of e-Learning systems? **10.** How do you include the cultural presence of Activity/Exercise Factor (AEF) (downloading, uploading, announcements, add comments and reading) in the development of e-Learning system? **11.** Do you think the following aspect of culture-oriented (like cultural, community, administration, student, content, teacher/lecturer, learning style, Activity/Exercise and static, individual, collective and dynamic culture) factors are important in the customisation of e-Learning system? • How important are these factors to you and example?	

• What other factor(s) can you add?	
Section C: How do cultural differences impact upon e-Learning design and implementation in SA?	10 min
1. How can e-Learning be established in SA using cultural factors? **2.** What aspects of culture impact upon negatively on e-Learning development? **3.** Do you find it difficult to manage cultural differences in designing e-Learning system? **4.** What area of culture is difficult to capture in the development of e-Learning system? **5.** What SA culture (language, rituals, manners, law/order and morality, dress, behaviour, belief, religion, norms, values, customs, and special symbols) is encouraging in the design of e-Learning system? **6.** How do you think culture affect the output and use of e-Learning educational purpose in SA?	
Section D: How is culture captured in the development of e-Learning?	20 min
1. How do you manage cultural differences in the e-Learning development or customisation? **2.** How have you represented cultural symbols and language on e-Learning development or customisation? **3.** Do you use Systems Development Methodology (SDM) (a process of analysing, designing and developing quality information systems) in the development of e-Learning? • What kind of methodology do you use? • How do you select (SDM) to suit a particular learner's culture? • How experienced are you on the use of (SDM)? **4.** What techniques or SDM are suitable for capturing culture in the development of e-Learning? **5.** Among your team of developers, do you discuss culture when developing e-Learning system? **6.** What is the significance or importance of culture in the development of e-Learning?	
Section E: What are the challenges faced in the development of e-Learning systems?	15 min
1. What are the problems encountered in the development or customisation of e-Learning in general? • What do you think is the cause of the problems? • What are the possible solutions to the problems? **2.** Has you your institution developed e-Learning in a different cultural-setting (language)? • How do you feel about developing a system not in your language? **3.** Why is the lack of cultural-orientation in regard to community factors (discussion forum, chat-rooms, news, announcements, wiki and bulletin) on the development of e-Learning system? • What are the possible lacks?	

4. What are possible: • Advantages of culture-oriented e-Learning system? • Disadvantages of culture-oriented e-Learning system? • Is culture-oriented e-Learning system achievable, if so? How can it be achieved **5.** What is the future of e-Learning in our present society? **Ending the session (Session ends – interviewer runs ending session):**	
✓ Seek for more or additional input from the respondent ✓ Finalise all the recording ✓ Vote of thanks to respondent	

ANNEXURE B: RESEARCH QUESTIONAIRES

FOR OFFICE USE ONLY: Respondent No: _____

VOLUNTARY QUESTIONNAIRE FOR
TOWARD A CULTURE-ORIENTED E-LEARNING SYSTEM DEVELOPMENT FRAMEWORK (E-LSDF) IN HIGHER EDUCATION INSTITUTIONS: SOUTH AFRICA

North-West University
Researcher: Joshua Chukwuere
Supervisor: Prof N. Mavetera

Note to the respondent

- We need your help to understand.
- Although we would like you to help us, you do not have to take part in this survey.
- If you do not want to take part, just hand in the blank questionnaire to the researcher.
- What you say in this questionnaire will remain private and confidential. No one will be able to trace your opinions back to you as a person.

This questionnaire has four parts:

Section A: Ask demographic questions of the participants; age, gender to academic historical questions.
Section B: Ask questions to comprehend from learners current challenges facing e-Learning users.
Section C: Ask questions to understand from learners how their cultures can be represented on the e-Learning.

Definition of terms:

1. **E-Learning** ("borderless virtual learning with use of multi-media technologies")
2. **Culture** ("A culture can be seen as shared values, ambition, motives, emotions, identities, belief, meanings and interpretation of importance from similar knowledge with a collective membership and can be transferred to generations" or "is seen as a system that represents people's ideas and values in a specific environment").
3. **Cultural-oriented** ("it symbolises the necessity of culture on e-Learning system development, because learning occurs in an environment where culture exists")

How to complete the questionnaire

1. Please answer the questions as truthfully as you can. Also, please be sure to read and follow the directions for each part. If you do not follow the directions, it will make it harder for us to do our project.
2. We are only asking you about things that you and your fellow students should feel comfortable telling us about. If you do not feel comfortable answering a question, you can indicate that you do not want to answer it. For those questions that you do answer, your responses will be kept confidential.

3. You can mark each response by making a tick or a cross, or encircling each appropriate response with a PEN (not a pencil), or by filling in the required words or numbers. For any enquiry you can contact the supervisor Prof. N. Mavetera on nehemiah.mavetera@nwu.ac.za.

Thank you very much for filling in this questionnaire.

SECTION 1: Permission to use my responses for academic research I hereby give permission that my responses may be used for research purposes provided that my identity is not revealed in the published records of the research. Initials and surname: _____			
No	**Question 1 (Section A): General personal particulars (Biographic Questions)** Please mark only ONE option per question on this section below.		
A1.	Gender: □ Male □ Female	A2.	Your age group: □ 17-21 □ 22-26 □ 27-31 □ 32-36 □ 37 and above
A3.	Please indicate if you are a staff or student. □Staff □Student □Both	A4.	Institution of study/Place of employment: □Mafikeng Campus □Potchefstroom Campus □Vaal Campus
A5.	Your Faculty □Agriculture Science and Technology □Commerce and Administration □Education □Human and Social Science □Law	A6.	As a student, what is your current level/year of study? □First year □Second year □Third year □Fourth year □Postgraduate
A7.	Can you please select your home language: □Afrikaans □English □IsiZulu □IsiXhosa □XiTsonga □SiSwati □Setswana □Southern SeSotho □TshiVenda □Sepedi □IsiNdebele		

	□Other		
	Question 2 (Section B): What are the challenges facing the current e-Learning system?		
B1.	Where do you usually access e-Learning (eFundi)? □On campus □Off campus	B2.	Where do you often access the e-Learning (eFundi), if not on campus? □Work □Home □Community library □Internet café □Don't know
B3.	What method do you most often use to connect to the e-Learning (eFundi)? □Cell phone □Desktop □IPad □Laptop □None of the above	B4.	Have you ever taken a class in which the teaching was done purely over the e-Learning (eFundi)? □Yes □No □Not sure
B5.	Do you use e-Learning (eFundi) in your modules? □Yes □No □Not sure	B6.	How do you communicate with your lecturer? □EFundi □Email □Face-to-face □Phone call □All of the above
B7.	Would you prefer e-Learning (eFundi) design in your home language? □Yes □No □Not sure	B8.	Would you understand e-Learning (eFundi) more on? □English □Home Language □Both
B9.	Do you learn better on e-Learning (eFundi) instead of in a class-room? □Yes □No □Not sure	B10.	Which features of e-Learning (eFundi) platform do you usually use? (you can select more than one possible answer) □Access slides/resources □Check announcement □Forums/message □Upload documents (assignments) □Answer online quizzes/tests/exams □Homework/projects/presentations □Group work discussions □All of the above
B11.	Can you be able to customise e-Learning (eFundi) to your home language? □Yes □No □Not sure	B12.	Have ever been consulted by e-Learning (eFundi) developers while developing any e-Learning system? □Yes □No □Not sure
B13.	Does your institution encourage you to use e-Learning (eFundi) often?	B14.	How would you best describe the current state of e-Learning (eFundi)?

	□Yes □No □Not sure		□Effective □Problematic/Difficult □Ineffective
B15.	What are the challenges do you face/experience when using e-Learning (eFundi) compare to class-room learning? □Not user-friendly □Outdated content □Unreliable network/connection □None of the Above	B16.	Has e-Learning (eFundi) been beneficial to you studies and enable you to develop good learning style? □Strongly agree □Agree □Not sure □Disagree □Strongly disagree
B17.	What part of these elements of culture influences your usage of e-Learning (eFundi)? □Religion □Values and attributes □Language □Law and politics □Beliefs □Communication □Symbols □Power □Customs and traditions □None of the above	B18.	How do these cultures (on question 17) impact upon how you learn? □To understand well □To think □No influence □Answering questions □None of the above
	Question 3 (Section C): How can cultural-oriented e-Learning be implemented to serve learners?		
C19.	I find e-Learning (eFundi) easy to use. □Strongly agree □Agree □Not sure □Disagree □Strongly disagree	C20	I have experienced little or no technical problems when trying to use e-Learning (eFundi)? □Strongly agree □Agree □Not sure □Disagree □Strongly disagree
C21	Do you think having all your teaching and learning and support on e-Learning (eFundi) would make you attend more class session? □Strongly agree □Agree □Not sure □Disagree □Strongly disagree	C22	With regard to your studies, have you found e-Learning (eFundi) forum supporting and encouraging? □Strongly agree □Agree □Not sure □Disagree □Strongly disagree
C23	As a student, do you think e-Learning (eFundi) support is even more important when studying your major modules? □Strongly agree	C24	Do you feel your current e-Learning (eFundi) promotes a favourable learning experiences? □Strongly agree

	□Agree □Not sure □Disagree □Strongly disagree		□Agree □Not sure □Disagree □Strongly disagree
C25	What do you think are the issues of e-Learning (eFundi)? □Lack of cultural elements □Unfriendly to use □Lack of user's knowledge □Not sure □Other	C26	In future would you like to see further development and course delivery through online learning (eFundi), with less contact time in lectures? □Strongly agree □Agree □Not sure □Disagree □Strongly disagree
C27	Do you think cultural factors (like honour, obedience, respect and regard for authority, mutual bond and friendship) have an impact upon how e-Learning (eFundi) is designed? □Yes □Somewhat □Not sure □Not at all	C28	Do you think community factors (example group discussion forum, chat-rooms, news, announcements, wiki and bulletin) can help to shape your learning capacity? □Yes □Somewhat □Almost none/Not sure □Not at all
C29	Do you think administrative factors should be considered while setting-up e-Learning? □Yes □Somewhat □Almost none/Not sure □Not at all	C30	Are content factors (study guide, textbook, hand-out, journals, magazine and others) great important to students on e-Learning (eFundi)? □Yes □Somewhat □Almost none/Not sure □Not at all
C31	Does learning style (like experience, needs, demands and expectation), assist students to remain focus in the learning field? □Yes □Somewhat □Almost none/Not sure □Not at all	C32	Level of assistance you receive from lecturers when facilitating e-Learning (eFundi)? □Full assistance □Partial assistance □No assistance

C33	Does Activity/Exercise Factor (AEF) (downloading, uploading, announcements, add comments and reading) assist you to remain focus in the learning field? □Yes □Somewhat □Almost none □Not at all	C34	Do you think all of factors (cultural, community, administrative, student, content, teacher/lecturer, learning style and Activity/Experience and static, individual, collective and dynamic culture) mentioned are important to an efficient (e.g eFundi) e-Learning system? □Yes □Somewhat □Almost none □Not at all

ANNEXURE C: DESCRIPTION OF COMPOSITE MEASURE CREATED THROUGH FACTORS ANALYSIS

Research questions	**Question/Variables**	**Planned scale/option**		**Actual scale**	
		Response	**Scale**	**Response**	**Scale**
Personal particulars (Biographic questions)	Your age group	17-21 22-26 27-31 32-36 37 and above	1 2 3 4 5	15-25 26-35 36-45 46-6	1 2 3 4
What are the challenges facing the current e-Learning system?	Where do you usually access e-Learning (eFundi)?	On campus Off campus	1 2	Single location Multiple locations	1 2
	Where do you often access the e-Learning (eFundi), if not on campus?	Work Home Community library Computer laboratory Internet café Campus library Don't know	1 2 3 4 5 6 7	Single location Multiple locations	1 2
	What method do you most often use to connect to the e-Learning (eFundi)?	Cell phone Desktop IPad Laptop None of the above	1 2 3 4 5	Single method Multiple methods	1 2
	How do you communicate with your lecturer?	EFundi Email Face-to-face Phone call All of the above	1 2 3 4 5	Single channel Multiple channels	1 2
	Which features of e-Learning (eFundi) platform do you usually use?	Access slides/resources Check announcement Forums/message Upload documents (assignments) Answer online quizzes/tests/exams Homework/projects/presentations Group work discussions All of the above	1 2 3 4 5 6 7 8	Single feature Multiple features	1 2

	What are the challenges do you face/experience when using e-Learning (e-fundi) compare to classroom learning?	Not user-friendly Out-dated content Unreliable network/connection None of the Above	1 2 3 4	Single issue Multiple issues	1 2
	Has e-Learning (eFundi) been beneficial to you studies and enable you to develop good learning style?	Strongly agree Agree Not sure Disagree Strongly disagree	1 2 3 4 5	Agree/Strongly agree Not sure Disagree/Strongly disagree	1 2 3
	What part of these elements of culture influences your usage of e-Learning (e-fundi)?	Religion Values and attributes Language Law and politics Beliefs Communication Symbols Power Customs and traditions None of the above	1 2 3 4 5 6 7 8 9 10	Single elements Multiple elements	1 2
	How do these cultures (on question 17) impact upon how you learn?	To understand well To think No influence Answering questions None of the above	1 2 3 4 5	To understand well To think Answering questions None/No influence	1 2 3 4
How can cultural-oriented be implemented on e-Learning to serve learners?	I find e-Learning (eFundi) easy to use.	Strongly agree Agree Not sure Disagree Strongly disagree	1 2 3 4 5	Agree/Strongly agree Not sure Disagree/Strongly disagree	1 2 3
	I have experienced little or no technical problems when trying to use e-Learning (eFundi)?	Strongly agree Agree Not sure Disagree Strongly disagree	1 2 3 4 5	Agree/Strongly agree Not sure Disagree/Strongly disagree	1 2 3
	Do you think having all your teaching and learning and support on e-Learning (eFundi) would make you attend more class session?	Strongly agree Agree Not sure Disagree Strongly disagree	1 2 3 4 5	Agree/Strongly agree Not sure Disagree/Strongly disagree	1 2 3
	With regard to your studies, have you found e-Learning (eFundi) forum supporting and encouraging?	Strongly agree Agree Not sure Disagree Strongly disagree	1 2 3 4 5	Agree/Strongly agree Not sure Disagree/Strongly disagree	1 2 3
	As a student, do you think e-Learning (eFundi) support is even more important when studying your major modules?	Strongly agree Agree Not sure Disagree Strongly disagree	1 2 3 4 5	Agree/Strongly agree Not sure Disagree/Strongly disagree	1 2 3
	Do you feel your current e-Learning (eFundi) promotes a favourable learning experience?	Strongly agree Agree Not sure Disagree	1 2 3 4	Agree/Strongly agree Not sure	1 2 3

		Strongly disagree	5	Disagree/Strongly disagree	
	What do you think are the issues of e-Learning (eFundi)?	Lack of cultural elements Unfriendly to use Lack of user's knowledge Not sure Other	1 2 3 4 5	Single issue Multiple issues	1 2
	In future would you like to see further development and course delivery through online learning (eFundi), with less contact time in lectures?	Strongly agree Agree Not sure Disagree Strongly disagree	1 2 3 4 5	Agree/Strongly agree Not sure Disagree/Strongly disagree	1 2 3
	Do you think community factors (example, group discussion forum, chat room, news, announcements, wiki and bulletin) can help to shape your learning capacity?	Yes Somewhat Almost none Not at all	1 2 3 4	Yes Somewhat Not sure Not at all	1 2 3 4
	Do you think administrative factors should be considered while setting up e-Learning?	Yes Somewhat Almost none Not at all	1 2 3 4	Yes Somewhat Not sure Not at all	1 2 3 4
	As content factors (study guide, textbook, hand-out, journals, magazines and others) great important to students on e-Learning (eFundi)?	Yes Somewhat Almost none Not at all	1 2 3 4	Yes Somewhat Not sure Not at all	1 2 3 4
	Does learning style (like experience, needs, demands and expectation), assist students to remain focus in the learning field?	Yes Somewhat Almost none Not at all	1 2 3 4	Yes Somewhat Not sure Not at all	1 2 3 4
	Does Activity/Exercise factor (AEF) (downloading, uploading, announcements, add comments and reading) assist you to remain focus in the learning field?	Yes Somewhat Almost none Not at all	1 2 3 4	Yes Somewhat Not sure Not at all	1 2 3 4
	Do you think all of factors (cultural, community, administrative, student, content, teacher/lecturer, learning style, and Activity/Exercise and static, individual, collective and dynamic culture) mentioned are important to an efficient (eFundi) e-Learning system?	Yes Somewhat Almost none Not at all	1 2 3 4	Yes Somewhat Not sure Not at all	1 2 3 4

ANNEXURE D: CORRELATION ANALYSIS OF SECTION B IN THE QUESTIONNAIRE

Pearson Correlation Coefficients, N = 728 Prob > |r| under H0: Rho=0											
	A7	**B7**	**B8**	**B9**	**B11**	**B12**	**B13**	**B14**	**B15**	**B17**	**B18**
A7 Home language	1.00000	0.12816 0.0005	-0.03187 0.3905	0.00680 0.8548	0.00747 0.8406	0.03952 0.2870	-0.10356 0.0052	0.00939 0.8002	-0.07321 0.0483	-0.02361 0.5248	-0.11953 0.0012
B7 Prefer eLearning designed in home language?	0.12816 0.0005	1.00000	-0.12005 0.0012	0.13167 0.0004	0.17707 <.0001	-0.07074 0.0564	0.05725 0.1227	0.02369 0.5234	-0.01096 0.7678	-0.03582 0.3345	0.06534 0.0781
B8 Preferred language for eLearning	-0.03187 0.3905	-0.12005 0.0012	1.00000	0.13382 0.0003	0.04749 0.2005	0.06198 0.0947	0.16016 <.0001	0.11247 0.0024	-0.00328 0.9297	0.04937 0.1833	0.02038 0.5831
B9 Preferred eLearning over classroom?	0.00680 0.8548	0.13167 0.0004	0.13382 0.0003	1.00000	0.06014 0.1050	0.06440 0.0825	0.25025 <.0001	0.15799 <.0001	0.00499 0.8931	0.08762 0.0181	0.11576 0.0018
B11 Able to customise eLearning to home language?	0.00747 0.8406	0.17707 <.0001	0.04749 0.2005	0.06014 0.1050	1.00000	0.08241 0.0262	0.01262 0.7340	0.06329 0.0879	-0.00337 0.9278	0.02585 0.4861	0.00584 0.8749
B12 Ever consulted by eLearning developers?	0.03952 0.2870	-0.07074 0.0564	0.06198 0.0947	0.06440 0.0825	0.08241 0.0262	1.00000	0.06200 0.0946	0.04633 0.2118	-0.00551 0.8820	-0.02766 0.4562	-0.03062 0.4094
B13 Institution encourage you to use eLearning?	-0.10356 0.0052	0.05725 0.1227	0.16016 <.0001	0.25025 <.0001	0.01262 0.7340	0.06200 0.0946	1.00000	0.39634 <.0001	0.00441 0.9054	0.20197 <.0001	0.13565 0.0002
B14 Perception about state of eLearning	0.00939 0.8002	0.02369 0.5234	0.11247 0.0024	0.15799 <.0001	0.06329 0.0879	0.04633 0.2118	0.39634 <.0001	1.00000	0.06299 0.0894	0.09359 0.0115	0.09532 0.0101
B15 eLearning challenges compared to classroom	-0.07321 0.0483	-0.01096 0.7678	-0.00328 0.9297	0.00499 0.8931	-0.00337 0.9278	-0.00551 0.8820	0.00441 0.9054	0.06299 0.0894	1.00000	0.07536 0.0421	0.07754 0.0365
B17 Elements of cultural influence on eLearning	-0.02361 0.5248	-0.03582 0.3345	0.04937 0.1833	0.08762 0.0181	0.02585 0.4861	-0.02766 0.4562	0.20197 <.0001	0.09359 0.0115	0.07536 0.0421	1.00000	0.08484 0.0221
B18 Cultural impact upons on eLearning	-0.11953 0.0012	0.06534 0.0781	0.02038 0.5831	0.11576 0.0018	0.00584 0.8749	-0.03062 0.4094	0.13565 0.0002	0.09532 0.0101	0.07754 0.0365	0.08484 0.0221	1.00000

ANNEXURE E: CORRELATION ANALYSIS OF SECTION C IN THE QUESTIONNAIRE

Pearson Correlation Coefficients, N = 728 Prob > |r| under H0: Rho=0								
	A7	**C19**	**C20**	**C21**	**C22**	**C24**	**C25**	**C26**
A7 Home language	1.00000	0.00760 0.8378	0.03368 0.3642	-0.04563 0.2188	-0.01864 0.6155	0.03269 0.3784	-0.07689 0.0381	-0.06277 0.0906
C19 I find eLearning easy to use	0.00760 0.8378	1.00000	0.20036 <.0001	0.13153 0.0004	0.30311 <.0001	0.26490 <.0001	0.10407 0.0049	0.12534 0.0007
C20 Have experienced technical problems using eLearning	0.03368 0.3642	0.20036 <.0001	1.00000	0.09090 0.0141	0.16647 <.0001	0.20649 <.0001	0.00140 0.9698	0.09107 0.0140
C21 eLearning teaching supports will make me attend classes frequently	-0.04563 0.2188	0.13153 0.0004	0.09090 0.0141	1.00000	0.21866 <.0001	0.15929 <.0001	0.00631 0.8651	0.15033 <.0001
C22 eLearning forum supporting and encouraging my studies	-0.01864 0.6155	0.30311 <.0001	0.16647 <.0001	0.21866 <.0001	1.00000	0.39848 <.0001	0.00160 0.9657	0.13432 0.0003
C24 Current eLearning promotes favourable learning experience	0.03269 0.3784	0.26490 <.0001	0.20649 <.0001	0.15929 <.0001	0.39848 <.0001	1.00000	0.02898 0.4350	0.11817 0.0014
C25 Issues about eLearning	-0.07689 0.0381	0.10407 0.0049	0.00140 0.9698	0.00631 0.8651	0.00160 0.9657	0.02898 0.4350	1.00000	0.00537 0.8849
C26 Want to see course delivery through eLearning in future?	-0.06277 0.0906	0.12534 0.0007	0.09107 0.0140	0.15033 <.0001	0.13432 0.0003	0.11817 0.0014	0.00537 0.8849	1.00000

ANNEXURE F: CORRELATION ANALYSIS OF SECTION B AND SECTION OF THE QUESTIONNAIRE

Pearson Correlation Coefficients, N = 728 Prob > |r| under H0: Rho=0								
	A7	**C19**	**C20**	**C21**	**C22**	**C24**	**C25**	**C26**
A7 Home language	1.00000	0.00760 0.8378	0.03368 0.3642	-0.04563 0.2188	-0.01864 0.6155	0.03269 0.3784	-0.07689 0.0381	-0.06277 0.0906
B7 Prefer eLearning designed in home language?	0.12816 0.0005	0.03353 0.3663	0.02470 0.5057	0.04443 0.2312	0.03379 0.3626	0.08582 0.0206	-0.01284 0.7295	0.02771 0.4553
B8 Preferred language for eLearning	-0.03187 0.3905	0.13513 0.0003	0.04404 0.2353	-0.02864 0.4404	0.05643 0.1282	0.04999 0.1779	0.11048 0.0028	0.03321 0.3709
B9 Preferred eLearning over classroom?	0.00680 0.8548	0.19907 <.0001	0.09274 0.0123	0.07493 0.0433	0.17127 <.0001	0.12788 0.0005	0.20712 <.0001	0.08969 0.0155
B11 Able to customise eLearning to home language?	0.00747 0.8406	0.09386 0.0113	0.02838 0.4445	0.04904 0.1862	0.07419 0.0454	0.01379 0.7103	0.06027 0.1042	0.07471 0.0439
B12 Ever consulted by eLearning developers?	0.03952 0.2870	0.03206 0.3877	0.03915 0.2915	-0.04393 0.2365	0.04553 0.2199	0.08893 0.0164	-0.00185 0.9603	0.06248 0.0921
B13 Institution encourage you to use eLearning?	-0.10356 0.0052	0.31032 <.0001	0.04842 0.1919	0.07488 0.0434	0.22960 <.0001	0.18871 <.0001	0.19595 <.0001	0.04945 0.1826
B14 Perception about state of eLearning	0.00939 0.8002	0.31474 <.0001	0.14638 <.0001	0.07489 0.0434	0.22893 <.0001	0.32646 <.0001	0.07024 0.0582	0.06195 0.0949
B15 eLearning challenges compared to classroom	-0.07321 0.0483	0.08461 0.0224	0.12000 0.0012	0.01556 0.6752	0.01821 0.6237	0.03644 0.3262	0.04609 0.2142	0.03827 0.3024
B17 Elements of cultural influence on eLearning	-0.02361 0.5248	0.05725 0.1228	-0.05392 0.1461	0.03777 0.3088	-0.06773 0.0678	-0.07180 0.0528	0.21509 <.0001	0.08203 0.0269
B18 Cultural impact upon on eLearning	-0.11953 0.0012	0.08726 0.0185	0.08024 0.0304	0.11227 0.0024	0.08626 0.0199	0.09740 0.0085	-0.00024 0.9948	0.07008 0.0588

ANNEXURE G: CORRELATION ANALYSIS OF SECTION C IN THE QUESTIONNAIRE

Pearson Correlation Coefficients, N = 728 Prob > |r| under H0: Rho=0										
	A7	**C25**	**C27**	**C28**	**C29**	**C30**	**C31**	**C32**	**C33**	**C34**
A7 Home language	1.00000	-0.07689 0.0381	-0.02311 0.5336	-0.05998 0.1059	-0.03369 0.3640	-0.03115 0.4013	-0.02343 0.5280	0.00023 0.9950	-0.05899 0.1118	-0.08487 0.0220
C23 eLearning support more important in major modules	-0.00380 0.9185	0.03426 0.3560	0.13144 0.0004	0.14736 <.0001	0.10678 0.0039	0.07443 0.0447	0.14226 0.0001	0.15945 <.0001	0.15930 <.0001	0.08894 0.0164
C25 Issues about eLearning	-0.07689 0.0381	1.00000	-0.03834 0.3016	-0.04250 0.2521	-0.01884 0.6119	0.02531 0.4954	0.01540 0.6782	0.06262 0.0913	0.01840 0.6201	-0.04309 0.2456
C27 Think cultural factors have impact upon on eLearning?	-0.02311 0.5336	-0.03834 0.3016	1.00000	0.20702 <.0001	0.06960 0.0605	0.07568 0.0412	0.02226 0.5488	0.01914 0.6061	0.12389 0.0008	0.21098 <.0001
C28 Think community factors can help shape learning capacity?	-0.05998 0.1059	-0.04250 0.2521	0.20702 <.0001	1.00000	0.23207 <.0001	0.24469 <.0001	0.25336 <.0001	0.10113 0.0063	0.26231 <.0001	0.26967 <.0001
C29 Think admin. factors be considered in eLearning design?	-0.03369 0.3640	-0.01884 0.6119	0.06960 0.0605	0.23207 <.0001	1.00000	0.31472 <.0001	0.26667 <.0001	0.04575 0.2176	0.21583 <.0001	0.21358 <.0001
C30 Think content factor are important to students on eLearning?	-0.03115 0.4013	0.02531 0.4954	0.07568 0.0412	0.24469 <.0001	0.31472 <.0001	1.00000	0.33704 <.0001	0.01981 0.5936	0.24355 <.0001	0.21014 <.0001
C31 Does learning style assist students to focus	-0.02343 0.5280	0.01540 0.6782	0.02226 0.5488	0.25336 <.0001	0.26667 <.0001	0.33704 <.0001	1.00000	0.12595 0.0007	0.33058 <.0001	0.21514 <.0001
C32 Do lecturers assist on how to use eLearning?	0.00023 0.9950	0.06262 0.0913	0.01914 0.6061	0.10113 0.0063	0.04575 0.2176	0.01981 0.5936	0.12595 0.0007	1.00000	0.20682 <.0001	0.15650 <.0001
C33 Does AEF assist you to stay focused on eLearning field?	-0.05899 0.1118	0.01840 0.6201	0.12389 0.0008	0.26231 <.0001	0.21583 <.0001	0.24355 <.0001	0.33058 <.0001	0.20682 <.0001	1.00000	0.36946 <.0001
C34 Think above-listed factors are important to eLearning system?	-0.08487 0.0220	-0.04309 0.2456	0.21098 <.0001	0.26967 <.0001	0.21358 <.0001	0.21014 <.0001	0.21514 <.0001	0.15650 <.0001	0.36946 <.0001	1.00000

ANNEXURE H: CORRELATION ANALYSIS OF SECTION B IN THE QUESTIONNAIRE

Pearson Correlation Coefficients, N = 728 Prob > |r| under H0: Rho=0						
	A7	B7	B8	B11	B12	B17
A7 Home language	1.00000	0.12816 0.0005	-0.03187 0.3905	0.00747 0.8406	0.03952 0.2870	-0.02361 0.5248
B7 Prefer eLearning designed in home language?	0.12816 0.0005	1.00000	-0.12005 0.0012	0.17707 <.0001	-0.07074 0.0564	-0.03582 0.3345
B8 Preferred language for eLearning	-0.03187 0.3905	-0.12005 0.0012	1.00000	0.04749 0.2005	0.06198 0.0947	0.04937 0.1833
B11 Able to customise eLearning to home language?	0.00747 0.8406	0.17707 <.0001	0.04749 0.2005	1.00000	0.08241 0.0262	0.02585 0.4861
B12 Ever consulted by eLearning developers?	0.03952 0.2870	-0.07074 0.0564	0.06198 0.0947	0.08241 0.0262	1.00000	-0.02766 0.4562
B17 Elements of cultural influence on eLearning	-0.02361 0.5248	-0.03582 0.3345	0.04937 0.1833	0.02585 0.4861	-0.02766 0.4562	1.00000

ANNEXURE I: CORRELATION OF SECTION C OF THE QUESTIONNAIRE

Pearson Correlation Coefficients, N = 728 Prob > |r| under H0: Rho=0										
	A7	**C23**	**C27**	**C28**	**C29**	**C30**	**C31**	**C32**	**C33**	**C34**
A7 Home language	1.00000	-0.00380 0.9185	-0.02311 0.5336	-0.05998 0.1059	-0.03369 0.3640	-0.03115 0.4013	-0.02343 0.5280	0.00023 0.9950	-0.05899 0.1118	-0.08487 0.0220
C23 eLearning support more important in major modules	-0.00380 0.9185	1.00000	0.13144 0.0004	0.14736 <.0001	0.10678 0.0039	0.07443 0.0447	0.14226 0.0001	0.15945 <.0001	0.15930 <.0001	0.08894 0.0164
C27 Think cultural factors have impact upon on eLearning?	-0.02311 0.5336	0.13144 0.0004	1.00000	0.20702 <.0001	0.06960 0.0605	0.07568 0.0412	0.02226 0.5488	0.01914 0.6061	0.12389 0.0008	0.21098 <.0001
C28 Think community factors can help shape learning capacity?	-0.05998 0.1059	0.14736 <.0001	0.20702 <.0001	1.00000	0.23207 <.0001	0.24469 <.0001	0.25336 <.0001	0.10113 0.0063	0.26231 <.0001	0.26967 <.0001
C29 Think admin. factors be considered in eLearning design?	-0.03369 0.3640	0.10678 0.0039	0.06960 0.0605	0.23207 <.0001	1.00000	0.31472 <.0001	0.26667 <.0001	0.04575 0.2176	0.21583 <.0001	0.21358 <.0001
C30 Think content factor are important to students on eLearning?	-0.03115 0.4013	0.07443 0.0447	0.07568 0.0412	0.24469 <.0001	0.31472 <.0001	1.00000	0.33704 <.0001	0.01981 0.5936	0.24355 <.0001	0.21014 <.0001
C31 Does learning style assist students to focus	-0.02343 0.5280	0.14226 0.0001	0.02226 0.5488	0.25336 <.0001	0.26667 <.0001	0.33704 <.0001	1.00000	0.12595 0.0007	0.33058 <.0001	0.21514 <.0001
C32 Do lecturers assist on how to use eLearning?	0.00023 0.9950	0.15945 <.0001	0.01914 0.6061	0.10113 0.0063	0.04575 0.2176	0.01981 0.5936	0.12595 0.0007	1.00000	0.20682 <.0001	0.15650 <.0001
C33 Does AEF assist you to stay focused on eLerning field?	-0.05899 0.1118	0.15930 <.0001	0.12389 0.0008	0.26231 <.0001	0.21583 <.0001	0.24355 <.0001	0.33058 <.0001	0.20682 <.0001	1.00000	0.36946 <.0001
C34 Think above-listed factors are important to eLearning system?	-0.08487 0.0220	0.08894 0.0164	0.21098 <.0001	0.26967 <.0001	0.21358 <.0001	0.21014 <.0001	0.21514 <.0001	0.15650 <.0001	0.36946 <.0001	1.00000

ANNEXURE J: CORRELATION ANALYSIS OF SECTION B AND SECTION C OF THE QUESTIONNAIRE

Pearson Correlation Coefficients, N = 728 Prob > |r| under H0: Rho=0						
	A7	**B7**	**B8**	**B11**	**B12**	**B17**
A7 Home language	1.00000	0.12816 0.0005	-0.03187 0.3905	0.00747 0.8406	0.03952 0.2870	-0.02361 0.5248
C23 eLearning support more important in major modules	-0.00380 0.9185	0.05831 0.1160	0.02992 0.4202	0.07434 0.0450	-0.00414 0.9112	-0.01886 0.6114
C27 Think cultural factors have impact upon on eLearning?	-0.02311 0.5336	0.02706 0.4661	-0.04014 0.2794	-0.01623 0.6619	0.00887 0.8111	-0.06454 0.0818
C28 Think community factors can help shape learning capacity?	-0.05998 0.1059	0.03346 0.3673	-0.05288 0.1541	0.00910 0.8063	-0.02594 0.4847	-0.08084 0.0292
C29 Think admin. factors be considered in eLearning design?	-0.03369 0.3640	0.07294 0.0492	-0.00965 0.7949	0.04540 0.2211	0.06247 0.0921	-0.02648 0.4757
C30 Think content factor are important to students on eLearning?	-0.03115 0.4013	0.01341 0.7180	0.02539 0.4940	0.05453 0.1416	0.02917 0.4320	-0.05016 0.1764
C31 Does learning style assist students to focus	-0.02343 0.5280	0.06828 0.0656	0.02656 0.4744	0.01355 0.7150	-0.02021 0.5862	-0.10258 0.0056
C32 Do lecturers assist on how to use eLearning?	0.00023 0.9950	0.03730 0.3149	-0.01936 0.6020	0.09106 0.0140	0.05168 0.1636	0.00988 0.7902
C33 Does AEF assist you to stay focused on eLerning field?	-0.05899 0.1118	0.03904 0.2928	-0.03606 0.3313	0.07441 0.0448	0.00825 0.8242	-0.08836 0.0171
C34 Think above-listed factors are important to eLearning system?	-0.08487 0.0220	0.01332 0.7198	-0.03294 0.3749	0.02329 0.5304	0.01507 0.6848	-0.08499 0.0218

ANNEXURE K: THE TENTATIVE CATEGORIES, THEMES AND TOPICS

CATEGORIES	THEMES	TOPICS
The factors that should be considered when designing the e-Learning System (e-LS)	✓ Generic system is adopted from North-America and cultural factors not observed • Cultural factors unknown in development of system ✓ Students not directly involved so others (cultural and developers) decide • Student's culture may not be directly involved in development stage.	Generic system Lack of consultation Limited consultation • Survey

	✓ Students consulted indirectly only on customisation. • Survey, focus group and interview. • Student consulted through academic developments centres. ✓ No cultural aspects observed except in UCT that currently offers e-LS on certain language courses. ✓ Cultural factors: language, usability and design plan. ✓ Represented through fixed based multimedia based and through internet link. ✓ Learning styles not observed at design levels but flexibility is observed. ✓ Importance: direction, evaluation, continuity, monitoring and management. ✓ Lecturers influences by knowing what learners require in the design.	• Focus group • Interview • Academic Development Centre Lack of culture Language Usability Design plan Symbols Contents Quality content Support centres Lecturer Electronic catalogue (e-catalogue) Dialogue Lecturer Support centres Flexibility Contents Preference Support Evaluation Continuity Monitoring Management Support Expert Gathering learner requirement Conventional method Usability Language (home language) Influential

	✓ Downloading and uploading and any conventional method that students understand. ✓ Factors are moderately important. We focus more on type of instruction technology rather than culture.	
Cultural differences impact upon on design and implementation E-LS	✓ Developers only focus on usability in SA • Indigenous language possible but requires time and money. • Lecture/teachers and developers must consider learners profile considering cultural factors. ✓ Acceptability of technology with regards: **Religious beliefs**. Bainers of developers. ✓ Language. ✓ Language: Has not been done in the country yet. ✓ Religion; Language; Learners to determine content ✓ Usability; Knowledge of users	Usability Language system (home language) Implication (time and money). Learners profile. Religion Communication Personal belief Symbols Language Language Belief Learners profile Religion. Knowledge of the users Usability Good and quality Language Increase output
Capturing culture in the development of e-Learning system.	✓ User considerations and usability • Dialogue. • In content and not system ✓ By using familiar symbols and language ✓ Agile and Togaf framework (methodology)	Users involvement Usability Dialogue Content and not system Similar symbols Language Content Agile and Togaf methodology ADDIE Survey Interview Interacting with others

	• Survey and interview • No experience in medium ✓ No response on this question. ✓ None on cultural but on usability. ✓ Very important but not adequately considered as it's secondary.	Usability Feedback Content
Challenges in developing e-LS.	✓ Changing technology Time, money and resources. Increasing use of e-LS. ✓ No and Yes **No:** It very expensive and time consuming. **Yes:** Built in Afrikaans but only for some modules. **Generally:** It is different if language is not properly understood by student and English has proven better than Afrikaans. ✓ Community factors can observed. Forms must be in the design and what users prefer. ✓ Comfortable learning environment, personalisation and adaptive learning. Cost, human impact and suitable. Different but achievable through priority, money and HR. ✓ Increasing flexibility of formal classroom teaching technique.	Difficult: Managing users priority Managing time, resources Maintenance and customisation Managing large number of students Fast development: staff and resources Expensive: time and cost Lack in design Lack of flexibility Allow personalisation Implement adaptive learning Design a comfort and nice system Cost Learners exclusion Customisation Generic system Implication (money) Increase in learning presence

ANNEXURE L: The PhD colloquium certificates and the generated publication from the research progression

Proposal

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South Africa, 2735
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FHDRC 5/2011

PHD COLLOQUIUM

The members of the colloquium appointed to attend the presentation of

Mr J Chikwiere

on 12 June 2014 find it satisfactory and recommend that it be approved.

Type of presentation: Proposal

Approval: Approval with amendments

Prof Theuns Pelser
Director: Graduate School of Business and Government Leadership
Member of FHDRC

pp

Prof N Mavetera
Director: School of Economics and Decision Sciences
Member of FHDRC

pp Prof Lizzy Pelser

Prof J B van Lill
Director: School of Management Sciences
Member of FHDRC

Colloquium approval letter

Research methodology

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FHDRC 5/2015

PHD COLLOQUIUM

The members of the colloquium appointed to attend the presentation of

Mr J E Chukwuere

on 18 March 2015 find it satisfactory and recommend that it be approved.

Type of presentation: Methodology

Approval: Approved

Prof N E Barkhuizen
Research Professor
Chairperson of the FHDRC

Prof N Mavetera
Director: School of Economics and Decision Sciences
Member of FHDRC

pp.

Prof S Swanepoel
Executive Dean of FCA
Member of FHDRC

Colloquium approval letter

Research findings

NORTH-WEST UNIVERSITY
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FHDRC 5/2015

PHD COLLOQUIUM

The members of the colloquium appointed to attend the presentation of

Mr J Chukwuere

on 11 November 2015 find it satisfactory and recommend that it be approved.

Type of presentation: Findings / Methodology

Approval: Approved

pp: Thomas

Prof N Mavetera
Professor in School of Economics and Decision Sciences
Member of the FHDRC

pp.

Prof J B van Lill
Director: School of Management Sciences
Member of the FHDRC

Y. du Plessis

Prof J Meyer
Director: Graduate School of Business and Government Leadership
Member of the FHDRC

Colloquium approval letter

ANNEXURE M: Ethical clearance approval

NORTH-WEST UNIVERSITY
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The Department Head
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13 March 2015

To whom it may concern

Dear Sir/ Madam

Mr JE Chukwuere -18001815 student number: is a PhD student at the North West University.

Ethical clearance has been granted to proceed with the research.

The Ethical Clearance number is: NWU-00018-15-S9

.Project Title:. Toward a culture oriented e-Learning system development framework (e-LSDF) in Higher Education Institutions: South Africa.

Kind Regards

.....
Prof. E.N. Barkhuizen
Chair: Human Research Ethics Committee

ANNEXURE N: Certificate of language editing

NORTH-WEST UNIVERSITY
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13th July 2016

TO WHOM IT MAY CONCERN

CERTIFICATE OF EDITING

I, **Muchativugwa Liberty Hove**, confirm and certify that I have read and edited the entire thesis

Towards a culture-oriented e-Learning system development Framework in higher education institutions: South Africa

by **Joshua Ebere CHUKWUERE,** Student Number: 18001815.

This thesis is submitted in fulfillment of the requirements for the award of the degree of **Doctor of Philosophy (PhD) in Information Systems**

at the North-West University, Mafikeng Campus. Joshua was supervised by Professor **Nehemiah Mavetera** and Professor **Ernest Mnkandla** of the North-West University.

I hold a PhD in English Language and Literature in English and am qualified to edit academic work of such nature for cohesion and coherence.

The views and research procedures detailed and expressed in the thesis remain those of the researchers.

Yours sincerely

Dr M.L.Hove

Original details: Dr M.L.Hove(22055215) C:\Users\22055215\Desktop\CERTIFICATE OF EDITING.docm
13th July 2016

File reference: Dr M.L.Hove

ANNEXURE O: E-Learning challenges

	Questions/Variables	Question scales (options)	Frequency	Percentage
B1	E-Learning access location	Single location Multiple locations	721 7	99.04 0.96
B2	E-Learning access frequency	Single location Multiple locations	659 69	90.52 9.48
B3	E-Learning access method	Single method Multiple methods	592 136	81.32 18.68
B4	Ever attended e-Learning classes	Yes No Not sure	627 48 53	31.32 51.51 17.17
B5	Use e-Learning in any modules	Yes No Not sure	627 48 53	86.13 6.59 7.28
B6	Mode of communication with lecturer	Single channel Multiple channels	514 214	70.60 29.40
B7	Prefer e-Learning designed in home language	Yes No Not sure	203 425 100	27.88 58.38 13.74
B8	Preferred language for e-Learning	English Home language Both	440 61 227	60.44 8.38 31.18
B9	Preferred e-Learning over classroom	Yes No Not sure	155 389 184	21.29 53.43 25.27
B10	No. of features preferred for e-Learning	Single feature Multiple features	302 426	41.48 58.52
B11	Able to customise e-Learning to home language	Yes No Not sure	152 321 255	20.88 44.09 35.03
B12	Ever consulted by e-Learning developers	Yes No Not sure	41 589 98	5.63 80.91 13.46
B13	Institution encourages you to use e-Learning	Yes No Not sure	628 31 69	86.26 4.26 9.48
B14	Perception about state of e-Learning	Effective Problematic/Difficult Ineffective	596 78 54	81.87 10.71 7.42
B15	E-Learning challenges compared to classroom	Single issue Multiple issues	712 12	97.80 2.20
B16	E-Learning is beneficial to studies and learning style	Agree/Strong agree Not sure Disagree/Strongly disagree	604 12 112	82.97 1.65 15.38
B17	Elements of cultural influence on e-Learning	Single element Multiple elements	596 132	81.87 18.13
B18	Cultural impact upon e-Learning	To understand To think Answering questions	325 51 38	44.64 7.01 5.22

		None/No influence	314	43.13

ANNEXURE P: The implementation of culture-oriented e-Learning

	Questions/Variables	Question scales (options)	Frequency	Percentage
C19	I find e-Learning easy to use	Agree/Strongly agree Not sure Disagree/Strongly disagree	658 8 62	90.38 1.10 8.52
C20	Have experienced technical problems using e-Learning	Agree/Strongly agree Not sure Disagree/Strongly disagree	441 32 255	60.58 4.40 35.03
C21	E-Learning teaching supports will make me attend classes frequently	Agree/Strong agree Not sure Disagree/Strongly disagree	380 41 307	52.20 5.63 42.17
C22	E-Learning forum supporting and encouraging my studies	Agree/Strong agree Not sure Disagree/Strongly disagree	535 8 185	73.49 1.10 25.41
C23	E-Learning support more important in major modules	Agree/Strong agree Not sure Disagree/Strongly disagree	554 15 159	76.10 2.06 21.84
C24	Current e-Learning promotes favourable learning experience	Agree/Strong agree Not sure Disagree/Strongly disagree	569 7 152	78.16 0.96 20.88
C25	Issues about e-Learning	Single issue Multiple issues	688 40	94.51 5.49
C26	Want to see course delivery through e-Learning in future	Agree/Strong agree Not sure Disagree/Strongly disagree	442 59 227	60.71 8.10 31.18
C27	Think cultural factors have impact upon e-Learning	Yes Somewhat Not sure Not at all	237 191 184 116	32.55 26.24 25.27 15.93
C28	Think community factors can help shape learning capacity	Yes Somewhat Not sure Not at all	474 167 47 40	65.11 22.94 6.46 5.49
C29	Think administrative factors be considered in e-Learning design	Yes Somewhat Not sure Not at all	535 130 41 22	73.49 17.86 5.63 3.02
C30	Think content factors are important to students on e-Learning	Yes Somewhat Not sure Not at all	584 103 21 20	80.22 14.15 2.88 2.75
C31	Does learning style assist students to focus	Yes Somewhat Not sure Not at all	491 169 44 24	67.45 23.21 6.04 3.30
C32	Do lecturers assist on how to use e-Learning	Full assistance Partial assistance No assistance	274 320 134	37.64 43.96 18.41
C33	Does AEF assist you to stay focused on e-Learning field	Yes Somewhat Not sure Not at all	464 197 40 27	63.74 27.06 5.49 3.71

C34	Think above-listed factors are important to e-Learning system	Yes Somewhat Not sure Not at all	476 183 30 39	65.38 25.14 4.12 5.36

ANNEXURE Q: Advantages and disadvantages of the waterfall model

The advantages and disadvantages of the waterfall model can be voluminous, but, the study limits itself to these discussed below.

Advantages of waterfall model

Waterfall model goes with advantages. Most importantly, the model stresses more on requirement and planning in the system development process and this structure is suitable for huge system project (Petersen et al., 2009), it allows for detailed understanding of system and client requirement in theory (Munassar & Govardhan, 2010). However, users are not always certain on what they want as pre-development, they are always confused and uncertain. The developers are allowed to understand the proposed system before the start and the iterative nature of the development can satisfy customers' expectations. This means the initial definition of the users and system requirement (Geambaşu, Jianu, Jianu & Gavrilă, 2011). According to Munassar and Govardhan (2010), the development objectives as well as development road-map is delivered and documentation is done. The initialisation of the purpose beforehand allows for greater inclusion of e-LSDF components and features throughout the system development cycle.

Disadvantages of waterfall

Waterfall is related to "high cost". Approval of each phase is needed for the continuation of another phase and changes are expensive to adapt (Petersen et al., 2009). The iteration process is difficult to adopt and any problem identified will be delayed and testing done at the end of the phases (Feitelson, 2011). This can be regarded as failure. The failure can be attributed to "large scope" because of its inadequacy to manage large system requirement scope (Petersen et al., 2009).

The structured process followed in waterfall could not meet or address customers' expectations at the end of development and these result in many features not used and making integration of the whole systems complex and change adaption and testing impossible. However, research shows that not less than "400 waterfall projects have shown that the software being developed is either not deployed or if deployed, it is not used" (Petersen et al., 2009: 387). This shows

that something is missing in this model. Though the development time can increase leading to the final project lacking or not reflecting on the present challenges and changes in the market, these changes result in innovation in the world of e-Learning technology. But waterfall model can be static in adaption to changes during initiation and development. The challenges and disadvantages of waterfall invoke (light weight) agile techniques as an alternative solution. Again, the model lacks risk management ability, it is expensive to manage small or serious mistakes, "inflexible" and lack of users' engagement (Munassar & Govardhan, 2010).

ANNEXURE R: Agile approach (Continued)

The iterative development process of agile produces high quality software products that adapt and adjust to changes that may occur in the development overtime (Rosenblatt, 2014), but in the past, the Quality Assurance (QA) was dealt with externally (Bajnaid et al., 2012). QA ensures that standard software product is delivered meeting expectations and same standard is applied when implementing e-LSDF in the context. However, entrenching quality assurance into agile is still a challenge, if its uses ontological approach aimed at implementing a system embedding System Quality Assurance (SQA). According to Bajnaid et al. (2012), SQA is the most significant aim of development and maintenance phase, because of the quick changing business and technical environment in effort to deliver high quality software from traditional to the agile development methods. As said earlier, the present e-Learning technologies are ever changing and together with learning culture and style, the approach is well accommodated in the e-LSDF.

All agile approaches view software development as an empirical exercise. The development length of agile project ranges between one to four weeks but more than 30 days (Williams, 2007). Software requirements change over-time. Its Manifesto is static on quick and soft software development but high quality is embedded, and the current agile process and method cannot back-up this claim in this changing technical and business requirement. Developers need to tailor agile methods to meet required manifestos (Bajnaid et al., 2012). To achieve agile manifesto, quality task should be embedded in the development process from analysis to delivery. It is possible to achieve this, because software development is done timely and budget is considered more than quality attributes. However, high quality software can be achieved through a combination of knowledge and skills from other software engineering discipline including system analysts to SQA specialists (Bajnaid et al., 2012). In overcoming the shortfall in agile method, Bajnaid et al. (2012), proposed "process-driven e-Learning system" to furnish

"just-in-time" and SQA method, requirements, standards and tools. Process-driven methods ensure that developers acknowledge testing procedures and other SQA-related issues during the development cycle. This study proposes that agility is dependent on 'tacit knowledge, idea, skilled and motivated employees and recurrent communications' through iteration.

Meanwhile, the development procedures can reflect daily changes in the design, for instance, waterfall method as a traditional procedure is less flexible to development changes. Waterfall is built on plan, while agile method is based on iteration or incremental building in prototypes and continually modifying till users requirements are met (Shelly & Rosenblatt, 2012). As the agile development goes on, developers review, modify, extend and unify original versions into the final software. The agile approach stresses more on feedback and every incremental phase is impact upon by what was done and lessons are learned in the preceding phases. For example, one of the agile approaches (Lean Software Development (LSD)) can be traced back to Japanese auto industry that uses flexible manufacturing system to boost productivity and team-effort is vital. However, it can be said that agile comparatively is new to system development especially its iterative enhancement method and timeserving development process (Williams, 2007).

We can say in this study, after a decade, agile development approach is no longer new in the industry. Although each phase of the iteration is a mini-product under-taking starting with analysis requirements, design, implementation and test and delivery, the measurable evidence shows that deadlines are reduced and there is increase in efficiency and productivity. However, these methodologies are being criticised for failing to develop a platform or framework for a secure system (Firdaus et al., 2013). Though, e-Learning system is a dynamic and scalable, innovative systems are needed as flexible methodologies to match the changes in the educational environment and, as noted earlier, each of the methodologies under the family of agile can be suitable in the development of e-Learning system. This study proposes e-LSDF in agile methodology process, but any of the methodologies can be applied depending on the timing, budget and other tangible factors.

Advantages and disadvantages of ASD

Agile has advantages and disadvantages. Software development atmosphere is becoming not only competitive but also complex and adaptive measures are needed to overcome the uncertainty (Bajnaid et al., 2012). The advantages and disadvantages of ASD are just limited to the few provided, selected for their deep benefits to this study.

Advantages of the ASD model

ASD can lead to quicker knowledge being out-dated because of reduced product lifecycles (Bajnaid et al., 2012; Turk, France & Rumpe, 2000). The agile approach can be advantageous in dealing with flexibly changes and efficiency, it because helps to organise team engagement, continual system deliverable and also forecast pitfalls and risk as its speeds up development time. The model is focused on iterative and incremental development process in collaboration with stakeholders to deliver quality software, on time (six weeks), "cost effective" and change adaptive (Flora & Chande, 2014). The software is delivered in smallest functional segments as an easy adding of functions throughout the software lifecycle. Agile was can easily estimate risk (risk analyst) and changes are adapted easily (Flora & Chande, 2014). Agile favours communication than written documents and working software than the process as the primary focus (Flora & Chande, 2014; Turk et al., 2000).

Disadvantages of the ASD model

Agile can also be disadvantageous because it requires technicality and team members should be more technical with high communication skills (Bajnaid et al., 2012). Software development requires good communication (face-to-face contact) among the team members and agile practice finds this communication difficult to manage (Turk et al., 2000). Inadequate structure and documentation can expose the product to risk and again development depends on current user requirement change (Shelly & Rosenblatt, 2012). The methods can be problematic in dealing with corrections or shortages inserted into the software (Williams, 2007). Also, agile can be disadvantaged in that lack of good documentation could lead to loss of code or features (Turk et al., 2000).