An examination of how lecturers' pedagogical beliefs are reflected in their use of ICTs in teaching practice: A Case for Africa University EMBA Lecturers.

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COMPULSORY DECLARATION

This work has not been previously submitted in whole, or in part, for the award of any degree. It is my own work. Each significant contribution to, and quotation in, this dissertation for the work, or works, of other people has been attributed, and has been cited and referenced.

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ABSTRACT

This study aims to examine how university lecturers' pedagogical beliefs are reflected in their use of Information and Communication Technologies (ICTs) in teaching practice.

In the study, six lecturers were surveyed to determine their pedagogical beliefs. The findings of the lecturers' beliefs survey indicated that no one lecturer strictly held one belief construct. They instead held a mixture of the beliefs and the distinction was in the actual mix. The two dominant belief constructs were close to constructivist and close to traditionalist. These belief constructs were reflected in the way participating lecturers used ICTs for content presentation, learning environment organization and management, choice of learning activities and for portraying student-teacher roles in the teaching-learning process. General consistency between lecturer beliefs and their use of ICTs in actual practice was noted.

This study recommends that adequate time be given to lecturers for adoption and use of various ICT tools. Despite the different rate of adoption, all lecturers use ICTs for teaching as and when they feel comfortable, ready and appreciate the tool's affordances. It is also necessary that staff trainers and advocates for teaching with technology understand that there is no one-size-fit-all instructional tool but options be given to lecturers to choose what best suits their pedagogical beliefs, readiness, subject matter and student learning styles. All they need to do is to provide guidelines and skills for effective adoption and integration of educational technologies in actual teaching practice. Finally it is also recommended that further study be undertaken across all faculties to ensure maximum possible support is given to the lecturers.

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LIST OF ACRONYMS AND ABBREVIATIONS

AU	Africa University
ICT	Information and Communication Technology
ETU	Educational Technologies Unit
EMBA	Executive Master of Business Administration
FMA	Faculty of Management and Administration
CLMS	Content Learning Management System
F2F	Face to Face
eLearning	Electronic Learning
m-Learning	Mobile Learning

CHAPTER ONE

1. INTRODUCTION

Emerging innovations in ICTs have created incremental and radical transformations in the education fraternity (Cebeci & Tekdal, 2006). More and more smart schools, virtual campuses and new forms of open universities are springing up all over the richer world and a new lexicon of educational terminology is evolving alongside emerging technologies: e-learning, m-learning, e-mentoring, e-tutoring, web-based instruction, web-enhanced instruction, hybrid courses, blended learning models, computer-mediated learning, distributed learning and online education[1]. These developments have certainly stimulated a resurgence of interest in diversifying teaching and learning methods at all levels and some educators have expressed high hopes for the potential of technology to bring about improved teaching and learning (Fulton, 1999). However, results have been mixed over the years.

The use of educational technologies in higher education has grown remarkably over the last three decades (Gosmire & Grady, 2007:12) bringing with it diversity in technologies, a variety of pedagogies, development and integration of new teaching strategies that in turn, have brought about fundamental changes in teaching and learning approaches (Williams,

[1] Some other terms frequently interchanged with e-Learning include:

- online learning
- online education
- distance education
- distance learning
- technology-based training
- web-based training
- computer-based training (generally thought of as learning from a CD-ROM)
  http://www.worldwidelearn.com/elearning-essentials/index.html

2002). eLearning, with all its variations is continuing to take education activities beyond the physical classroom. Several technologies that were traditionally known as non-educational are being harnessed and transformed into powerful teaching and learning objects. For instance, technologies such as podcasts that have been converted into learning objects by making sure they have learning objectives and they adhere to learning objects' functionalities such as re-usability, interoperability (Cebeci & Tekdal, 2006).

African higher education institutions have not taken a spectator seat but are gradually introducing and integrating technology into their curricula (Karsenti, Mbangwana & Harper-Merret, 2009). Anecdotal evidence show that adoption and use of ICTs in education have been sporadic across institutions due to inhibiting factors such as, lack of skills; limited access to resources; inadequate policy frameworks; inadequate network infrastructure and many external factors. Research and documented studies on ICT access and use in African educational contexts is also still very limited (Karsenti, Mbangwana & Harper-Merret, 2009). Even so, far less attention is given to intrinsic factors that affect adoption and use of ICTs in university teaching, that is the role played by lecturer's pedagogical views and beliefs and how such beliefs shape ways in which technology is used in practice.

This study seeks to understand university lecturers' beliefs about teaching and learning, how these beliefs shape their views of best uses of technology, and the ways these beliefs are carried out in actual teaching practice.

This introductory chapter describes: the background context to the study; the rationale for undertaking the study; the research questions; and gives an overview of the remaining study chapters.

1.1. Background context to the study

The present study arose from my professional practice at Africa University (AU). In my work as staff developer and advisor in teaching with ICTs I observe some striking differences in the use of ICTs for teaching and learning by different lecturers despite equitable access to ICTs and staff training. In her SAIDE_RUFORUM report on "The Use of ICT at Africa University" Hoosen (2010:7) cites, *"The reluctance of academics to use technology presents an additional challenge to the University … the reluctance to use the new Moodle platform …."* This alludes to the fact that resources have been availed but there is some reluctance or use of such resources is somehow limited. My keen interest is in seeing lecturers taking full advantage of technology affordances and opportunities to enhance their teaching practice. As ICT usage gradually gains a firm foothold in the day-to-day processes of the university, it is crucial to engage in checks and balances to ensure effective integration and compliance to the institutional vision.

Despite efforts and investments into equitable access to ICTs at Africa University (Hoosen, 2010), adoption and usage varies significantly among lecturers from outright aversion to complete savvy. It is against this background that my interest in understanding the underlying factors that impact on AU lecturers' adoption and use of ICTs in teaching in general, with

particular interest in understanding how pedagogical beliefs are evidenced in the use of ICTs in teaching was born.

1.1.1. Location and demographic features of AU

This section provides an overview of: Africa University's location and demographic features; use of ICTs in teaching and learning at AU.

Africa University is a private, Pan-African higher education institution located in the beautiful eastern highlands of Zimbabwe. It is affiliated with and supported by the United Methodist Church. AU enjoys the patronage of students from all across Africa and enjoys an annual enrolment of approximately one thousand two hundred students from Anglophone, Lusophone and Francophone African nations. The mission of Africa University is:

> *"… to provide higher education of high quality, to nurture students in Christian values, and to help the nations of Africa achieve their educational and professional goals." (*Africa University 2003:vii) and its motto is *"investing in Africa's future."*

AU offers degree programmes in theological studies, health sciences, agriculture, natural resources, education, management and administration, computer science, intellectual property, leadership, governance and peace. The university also emphasises Pan-Africanism when recruiting staff with the current staff complement comprising administrative and academic staff from all across Africa and beyond. Teaching and learning delivery modes range from traditional face-to-face, online learning, blended and distributed learning modes (see Page 13). In most cases the choice of delivery mode remains the lecturer's but all are encouraged to

use available technologies for transforming their teaching towards either a blended approach or a distributed learning approach.

The University has embarked on an online distance education provision through setting up of satellite campuses in countries other than Zimbabwe in an effort to push the Pan-African mission across Africa. A pilot satellite campus was set up in Maputo Mozambique and it is envisaged that this will be a proof of concept initiative to inform the setting up of other satellite centre's across Africa.

1.1.2. Use of ICTs in teaching at Africa University

Since its inception in 1992, Africa University has strived to be a leading institution of higher learning through use of innovative ICT-enhanced pedagogical practices as evidenced by its ICT Department's vision that reads,

"Our vision is to make Africa University the leading institution of higher learning in terms of the efficient and effective use of ICT." (Africa University, 2003:495).

ICT policies were then developed and deployed to allow for acceptable use of resources across the university community. Sporadic use of ICTs was noted since then. Distance learning (DL) using emerging technologies has been part of AU's strategy plan since 2000 and this is alluded by its 2010-2015 Strategic Objective #5: "*Bring Africa University closer to the community, the rest of Africa and the World at large."* Progress has already been made in setting up a robust intra information and technology network system at the university through construction of a state-of-the-art library and ICT Centre (Hoosen, 2010).

Although teaching with modern technology remained a lecturer's choice until early 2003, anecdotal evidence has shown that it has become common practice in most lecture rooms and meeting places on campus leading to gradual installation of basic educational technologies in more than 75% of these venues. The setting up of a fully-fledged ICT Centre, in January 2005, with four teaching computer labs, one students' general access lab and three smart classrooms, has seen teaching with ICTs becoming norm and common practice. This also led to the establishment of the Educational Technologies Unit (ETU) within the ICT Department and appointment of the educational technologies administrator whose major function was to link the academic faculties with the ICT department through staff training and support. In 2008 a related policy framework was also appended to the revised Africa University ICT Policy 2003 framework to ensure effective use of ICT resources on campus. For instance, the ICT Policy statement 1.1.2 reads *"It is the policy of the university to ensure that all students, academic, administrative and support staff are trained on a continuing basis to equip them with the skills to efficiently utilise ICT in their functions."* (Africa University, 2008:np). In Hoosen's report, the student:computer ratio was 20:1 and staff: computer ratio was 1:1, and the university aimed to reach 5:1 student:computer ratio by 2012 (Hoosen, 2010:3).

During the same period Africa University began exploring possibilities of introducing eLearning and a team of pioneers was elected to champion the project. In 2004/2005 Africa University embarked on a gradual inception of blended and distributed learning approaches and the adoption of Moodle as the University's Content and Learning Management System (CLMS). Faculty champions worked with the Educational Technologies Unit in electronic

content development, staff training, best practices, related policy formulation and implementation. The use of the Moodle CLMS received tremendous buy-in from university administration and students such that by end of 2006 all course outlines were distributed through the CLMS and it became policy that every student and lecturer received a login account on the platform.

By this time AU had also developed a plan to create satellite campuses in Mozambique, Liberia, Congo and Angola and to link these campuses with AU using ICT infrastructure in which online learning would be the core mode of course delivery. A pilot centre was established in Maputo, Mozambique and an online Executive Master of Business Administration (EMBA) programme was launched in March of 2008.

1.1.3. Statement of the problem

The university administration and staff envisage the Maputo project as the proof of concept initiative that will inform the creation of other satellite campuses in other nations that are to be included in future. Anecdotal evidence from various sporadic evaluation reports on the Maputo initiative indicate some weaknesses and strengths in the implementation of the project, among which lecturers' distinctive use of learning technologies is given as one of the weaknesses. One would expect the Maputo EMBA lecturers to use ICTs in more or less the same way and at similar levels since they have a specialised agreed standard but, it is interesting to note that distinctive usage of ICTs in teaching are quite visible. Even in the on-campus blended learning scenarios, I have noticed that despite providing favourable infrastructural and policy environment, training and support, high and equitable access, and a

good incentive system, there also exist distinctive differences associated with the use of ICTs in teaching. The observed distinctions included, but not limited to, having the same tool used for very different purposes, from simple to advanced uses, some tools more widely used than others, some lecturers skipping from tools to tool without taking full advantages of the tool affordance. Commonalities are also noted but what really fascinates me is the distinctive use of ICTs. At this stage little has been done to determine causes of the distinctive usage and to ascertain strategies that address and ensure insignificant or no distinctions.

Lack of understanding of how lecturers construe and view teaching and learning has been a major barrier to improved quality of teaching and learning (Burroughs-Lange, 1996; Kember, 1997). Ertmer (2005:24) alludes to this notion when she says,

> *"… relatively few researchers have examined the relationship between teachers' pedagogical beliefs and their classroom uses of technology. Yet, without a clear understanding of this relationship, practitioners and researchers may continue to advocate for specific uses of technology that they are unable to facilitate or support, due to these underlying fundamental beliefs*."

Studies (Godfrey, 2001; Handal, Handal & Herrington, 2003; Hadley & Sheingold, 1993; Ringstaff & Yocam, 1994) have given reasons for low uptake of ICTs as including lack of supporting teachers' beliefs, traditional teaching practices, lack of teacher training, inadequate instructional preparation time, unavailability of adequate educational software and hardware in general, among others. Ertmer (2005) postulates that this might imply external factors may

not be sufficient for the transformation which suggests that additional intrinsic barriers, specifically related to teachers' pedagogical beliefs, may be at work.

Studies (Kagan, 1992; Nespor, 1987; Pajares, 1992) on teaching practices advocate for a need to understand the deeper factors embedded in the heart of classroom. This is related to teachers' pedagogical beliefs and how they affect the way technology is used in teaching. Pedagogical beliefs are defined as "*one's personal views, conceptions and theories about how learners learn, the classroom, curriculum, the methods of delivery and media tools to use."* (Ertmer, 2005:4).

Most studies have focused on student teachers' beliefs and subject-related contexts (Borg, 2001 - EFL; Czerniak & Lumpe, 1996 - Science; Fang, 1996 - Literacy; Vacc & Bright, 1999 – Mathematics; Wilson & Wineburg, 1988 – History) as opposed to looking at the pedagogical beliefs of practicing lecturers and their use of technology in teaching.

While previous studies have documented the influence of school teachers' pedagogical beliefs on classroom practices related to teaching of mathematics, science, history, EFL and literacy and some on student teachers' pedagogical beliefs in various subject-related contexts (Pajares, 1992; Quinn, 1998; Ertmer, 2005; Lim, 2007), little was done on university lecturers' beliefs about teaching and learning. It is therefore critical that research begins to enquire on whether student teachers' pedagogical beliefs are representative of and true for all teachers' beliefs despite level, experience and formal training, and whether university lecturers and school

teachers share the same professional up-bringing so as to share assumptions and derive generalizations from previous studies.

Africa University, as discussed above, has provided a relatively conducive environment and equitable conditions for extensive use of ICTs for teaching and learning, yet it was noted that lecturers adopt and use ICTs quite differently. It is against this background that I wish to look deep into the enabling and constraining factors with particular focus on the lecturers' typical pedagogical beliefs as a possible barrier and/or enabler. My objective is to examine how lecturers' pedagogical beliefs shape their views of best use of technology, and how these beliefs are reflected in the actual teaching activities and practice.

1.2. Aims and objectives of the study

In this study, my aim is to understand and ascertain pedagogical beliefs as one of the intrinsic factors that influence university lecturers' use of technology in teaching and learning, how these beliefs shape the lecturers' views of best uses of ICTs and the ways in which these beliefs are reflected in actual teaching activities. The objectives of the study are broken down as below:

1.2.1. To determine the pedagogical beliefs held by university lecturers;

1.2.2. To establish the extent to which lecturers perceive ICTs as relevant to teaching and learning;

1.2.3. To examine the relationship between lecturers' typical pedagogical beliefs and their beliefs about use of ICTs in the classroom;

1.2.4. To examine how lecturers' pedagogical beliefs are reflected in the ways they use technology in their teaching practice

1.2.5. To establish practical approaches to effective adoption and use of ICTs in university teaching practice.

1.3. Research questions:

The primary question is:

How are Africa University EMBA lecturers' pedagogical beliefs reflected in their use of ICTs for teaching?

The Sub Questions:

1. What beliefs do lecturers hold about teaching and learning?
2. To what extent do lecturers perceive ICTs as relevant to teaching and learning?
3. How do lecturers' beliefs about teaching and learning relate to their beliefs about use of ICTs in the teaching practice?
4. How are lecturers' beliefs about teaching reflected in the ways they use technology in their teaching?

1.4. Assumptions

The study was conducted under the following assumptions:

i. Practicing lecturers come to teach in university with their own existing pedagogical beliefs rooted in their personality and experiences as individuals and students during schooling. These beliefs may be influenced by historical circumstances and preconceptions that formed part of their upbringing. They may then be reshaped by

their formative teaching-learning experiences such as subject content knowledge, training and thereafter by related pedagogical experiences as lecturers.

ii. The selected respondents will give their earnest responses to all questions and tasks given to them throughout the study period.

iii. All the EMBA lecturers teach using all the available modes of delivery (Face-to-Face; online learning; block release; blended and distributed learning approaches)

1.5. Scope

The study was limited to Africa University's full-time EMBA lecturers because they teach both the online courses and the face-to-face on conventional and block release programmes giving a wider spectrum of how they believe use of ICTs enhances or disrupts their practice in the different yet unique teaching environments. The study was also limited to the pilot Online EMBA project in Maputo thereby not covering the campus EMBA courses.

1.6. Clarification of terms

***Lecturers' pedagogical beliefs*:** lecturer's personal views, conceptions and theories about how learners learn, the classroom, curriculum, methods of delivery and media tools to use (Ertmer 2005:4).

Information and Communication Technologies (ICTs): "*these are defined as a diverse set of technological tools and resources used to communicate, and to create, disseminate, store,*

and manage information. The technologies include computers, the Internet, telephony, broadcasting technologies (television and radio)" (Blurton, 2002:np.).

eLearning (E-learning, e learning) is "*The delivery of a learning, training or education program by electronic means. E-learning involves the use of a computer or electronic device (e.g. a mobile phone) in some way to provide training, educational or learning material. E-learning can involve a greater variety of equipment than online training or education, for as the name implies, "online" involves using the Internet or an Intranet. CD-ROM and DVD can be used to provide learning materials."* (Stockley, 2003:np.)

Online learning: *"the use of the Internet to access learning materials; to interact with the content, instructor, and other learners; and to obtain support during the learning process, in order to acquire knowledge, to construct personal meaning, and to grow from the learning experience."* (Ally Mohamed in Anderson, 2008:17)

Distributed learning "*comes from the concept of distributed resources. Distributed learning is an instructional model that allows instructor, students, and content to be located in different, non-centralised locations so that instruction and learning occur independent of time and place. The distributed learning model can be used in combination with traditional classroom-based courses, with traditional distance learning courses, or it can be used to create wholly virtual classrooms."* (Saltzberg & Polyson, 1995:10).

Blended learning: Whitelock & Jelfs (2003) opened a journal special issue on this topic with three definitions:

1. the integrated combination of traditional learning with web-based online approaches (drawing on the work of Harrison);
2. the combination of media and tools employed in an e-learning environment; and
3. the combination of a number of pedagogic approaches, irrespective of learning technology use (drawing on the work of Driscoll).

For this study blended learning means a combination of the all above which means blended learning is the integrated combination of a number of pedagogical approaches and delivery modes.

1.7. Structure of the study

Chapter 2 reviews relevant literature important to provide theoretical basis of the study describing how prior studies, experience and theory have led to the focus on my study questions. Chapter 3 presents the methodology and design processes used in the study which comprise the research site, the basis of participants' selection, the data collection and analysis. The findings and discussion are presented in chapter 4 giving the survey analysis, case study interview report and the direct observation analysis. The conclusions and recommendations are outlined in chapter 5.

1.8. Summary of chapter

This chapter presented background context to the study, statement of the problem, research questions, aims and objectives. It also outlined the assumptions and scope of the study.

The next chapter reviews and presents literature pertinent to the present study.

CHAPTER TWO

2. LITERATURE REVIEW

Overview

Review of literature related to the present study is presented in this chapter. Reviewing literature helps establish how new research relates to the field of study and complements what others have contributed (Anderson & Arsenault, 2002). Three streams of literature were therefore used in the present study: first, literature on lecturers' pedagogical beliefs and conceptions (Fox, 1983; Samuelowicz & Bain, 1992; Gow & Kember, 1993; Dall'Alba, 1991; Martin & Balla, 1991; Prosser, Trigwell & Taylor, 1994; Prosser & Trigwell 1999; Ertmer, 1999); second, studies on lecturers' beliefs about use of ICTs for teaching and learning (Dexter, Anderson & Becker, 1999; Ertmer, 2005; Ertmer & Simmons, 2006; Niederhauser & Stoddart, 2001) and third, research exploring the links between teachers' pedagogical beliefs and practice in general and the use of ICTs in teaching practice specifically (Ertmer, 2000; Ertmer, Gopalakrishnan & Ross, 2001; Albion & Ertmer, 2002; Ertmer, 2005; Gritter, 2005; Park & Ertmer, 2008). The chapter ends with a review of literature on the theoretical frameworks used in teacher's belief studies in higher education and how this informed my choice of theoretical framework for this study.

Much of the literature described in this chapter is from developed contexts as there are very few empirical studies concerning teacher beliefs and technology use for university teaching and learning in Zimbabwe and similar developing nations.

2.1. Teachers' beliefs and conceptions

This section examines the nature of teachers' pedagogical beliefs and conceptions; and their categorization in literature. To establish the postulated link between these pedagogical beliefs and use of ICTs in practice, understanding how individual lecturers typically conceptualise teaching and learning becomes critical. Similarly, although there is research suggesting that lecturers' pedagogical beliefs frame their practice (Trigwell & Prosser, 1996; Quinlan, 1997; Bain, 1998; Ertmer, 2005) more work is needed to map the patterns of the relationship. Putnam and Borko (1997:1281) rightly observe, "*… for professional development experiences to be successful in supporting meaningful change, they must take into account and address teachers' knowledge and beliefs*."

Reviewed literature indicates that there is a lot of confusion regarding definitions and labels used to describe teacher beliefs and this has impeded research in this area. The impediment stretches to educational research and practice in the higher education arena. As Beswick (2006) mentions, although the concept of beliefs has been a very popular element of research in recent decades, this construct lacks a commonly agreed definition. Literature contains inconsistent definitions of the term beliefs, different researchers use different definitions and labels.

Rockeach (1972) (cited in Kane, Sandrretto & Heath, 2002:113) defines a belief as "*any simple proposition, conscious or unconscious, inferred from what a person says or does, capable of being preceded by the phrase 'I believe that'* …" Fishbein and Ajzen (1975:131) define a belief "*as a representation of the information someone holds about an object, or a*

person's understanding of himself and his environment." This object can "*be a person, a group of people, an institution, a behavior, a policy, an event, etc., and the associated attribute may be any object, trait, property, quality, characteristic, outcome, or event.*" (p. 12). Nespor (1987), in his study on teachers' beliefs, proposes beliefs were personal presumptions or truths about physical or social reality, but the presumptions may deviate from reality due to strong evaluative and affective components or previous episodic memory. Sigel (1985:451) describes beliefs as "*mental constructions of experience*" and Richardson (1996:103) postulates that beliefs are "*psychologically held understandings, premises, or propositions about the world that are left to be true*."

In several studies, beliefs are used together with other terms such as knowledge, images, assumptions, orientations, approaches, conceptions, cognitions or personal theories interchangeably and the distinctions are vague (Borg, 2003; Pajares, 1992; Tsui, 2003; Woods, 1996). For instance, the distinction between beliefs and knowledge is sometimes quite confusing although various attempts have been made to make the distinction. Pajares (1992:309) points out, that "*distinguishing knowledge from belief is a daunting undertaking*" . Calderhead (1996:715) suggests that beliefs generally refer to "*suppositions, commitments, and ideologies,*" while knowledge refers to "*factual propositions and understandings.*" This means that after gaining knowledge of a proposition, one is still free to believe it or not depending on whether one has accepted it as true or false. Beliefs have stronger affective and evaluative components as compared to knowledge. Nespor (1987) describes beliefs, as being deeply personal, stable, rooted in vivid memories of past experiences that lie beyond individual control or knowledge, and are usually unaffected by persuasion. He states the four

characteristics of beliefs that distinguish beliefs from knowledge as "*existential presupposition, alternativity, affective and evaluative loading, and episodic structure."* Existential presuppositions are one's personal truths that cannot be affected by persuasion yet knowledge is a social construct – one has to agree with others. And alternativity is the conceptualization of ideal situations separate from present reality, to reach this ideal situation, knowledge systems where goals and paths to their achievement are required (Nespor, 1987).

Pratt (1992:204) defines conceptions as:

> *Conceptions are specific meanings attached to phenomena which then mediate our response to situations involving those phenomena. We form conceptions of virtually every aspect of our perceived world, and in so doing, use those abstract representations to delimit something from, and relate it to, other aspects of our world. In effect, we view the world through the lenses of our conceptions, interpreting and acting in accordance with our understanding of the world.*

This means conceptions of university teaching are the specific meanings attached to university teaching and learning phenomena, which are claimed to then mediate a lecturer's view of, and responses to, their teaching context.

Teacher beliefs are also conceptualised in many different ways in literature. For instance, Kagan (1992:66) notes "*even the term 'teacher belief' is not used consistently, with some researchers preferring, instead, teacher's 'principles of practice,' 'personal epistemologies,' 'perspectives,' 'practical knowledge' or 'orientations'*" Pajares (1992:307) labels teacher

beliefs as a "*messy construct"* noting that *"the difficulty in studying teachers' beliefs has been caused by definitional problems, poor conceptualisation, and differing understandings of beliefs and belief structures.*" For example, teachers' beliefs have been conceptualised as a set of assumptions that teachers hold on various educational processes such as curriculum, schooling, students, teaching and learning, and knowledge (Lovat & Smith, 1995). The term "*teachers' beliefs"* has been used to represent teachers' conceptions, practical knowledge, personal knowledge and experiential knowledge" (Anderson & Bird, 1995; Marland, 1994; Pajares, 1992). Kagan (1990:423) defines teacher belief as "*the highly personal ways in which a teacher understands classrooms, students, the nature of learning, the teacher's role in the classroom and the goals of education.*"

Teacher beliefs, as well as teacher knowledge and teacher thinking, comprise the broader concept of teacher cognition (Calderhead, 1996). But Kagan (1990:420) notes that the term 'teacher cognition' "*is somewhat ambiguous, because researchers invoke the term to refer to different products, including teacher's interactive thoughts during instruction, thoughts during lesson planning; implicit beliefs about students; classrooms; and learning; and reflections about their own teaching performance …."* Clandinin & Connelly (1987:488) refer to this lack of agreement in terminology among researchers as "*simply different words naming the same thing*." A teacher's belief system about teaching involves beliefs about students, learning, the nature of the science, epistemology, and the role teachers play (Wallace & Kang, 2004).

Teachers' pedagogical beliefs are beliefs about or preferred ways of teaching (Chai, 2010). There have been a number of studies that produced diverse schemes and categories for teachers' beliefs about teaching (Dall'Alba, 1991; Fox, 1983; Gow & Kember, 1993; Kember, 1997; Larsson, 1986; Samuelowicz & Bain, 1992; Trigwell, Prosser & Taylor, 1994) but generally they are categorised into the knowledge transmission view or the knowledge construction (constructivist) view (Teo, Chai, Lee & Hung, 2008).

Ravitz, Becker & Wong (2000) outline several basic aspects to the contrast between knowledge-transmission view and the knowledge-construction view. The first basic difference is in terms of the *theory of student learning* that defines instructional practice—i.e., "*the difference between learning through reception of facts and repetitive practice of discrete skills versus learning through effortful integration of new ideas with those previously believed*." Secondly, the *role of teacher and student*, in a transmissive learning theory, a lecturer's role "*consists of planning a set of activities in which particular subject content is experienced by students"* (e.g., presentation of new information, students answering questions in textbook). In constructivist the lecturer's role is to facilitate student-designed efforts, which is a more demanding job than merely studying and then presenting to students a pre-ordained body of content.

A third difference between these two pedagogical approaches is the importance that constructivism assigns to systematically created *social structures for learning*. Students' debates, collaborative group projects, and other activities involving the articulation of students' own ideas in concrete contexts are valued by constructivists for their power to

further individual understanding. A transmission-oriented philosophy does not emphasise the social mediation of ideas because it sees understanding as coming from listening and reading—from receiving explanations directly—rather than as a result of actively working with and applying those ideas in a social context.

A constructivist teaching approach attempts to make learning a more self-directed, personally-responsive, and socially-mediated process in which a learner's own motivation and effort are just as important, if not more central, to a student's education than the content or facts learned. This involves creating a learning environment so that students:

- *Identify their own issues and problems to be solved rather than having questions defined for them*
- *Decide how to explore an issue or solve a problem rather than having these procedures defined by the teacher*
- *Reflect further and makes sense of what they have experienced, and*
- *Interact with peers by presenting their solutions, describing how solutions were reached, and receiving feedback.*

*A classroom where these principles—rather than transmission- or skills-practice principles—guide a majority of moment-to-moment teaching decisions would be considered a constructivist learning environment. (*Ravitz, Becker & Wong, 2000:4)

An intermediate category that links or bridges these two major views is also presented quite differently and at times not so well defined. For instance, some categories capture broad notions of involving students in the process of learning (‘*facilitating understanding’*

Samuelowicz & Bain, 1992; '*Helping students develop concepts*' Prosser, Trigwell & Taylor, 1994) and some have defined the intermediate categories as "*teacher- student interaction*" (Kember, 1997; Kember & Kwan, 2000). According to Samuelowicz (1999:11) it is however, "*the nature of the interaction which is important not the interaction as such – depending on the nature of the interaction, teaching could be seen as either transmitting information or facilitating learning.*"

Ravitz, Becker & Wong, (2000:3) make an interesting observation, "*no two teachers are perfectly alike in how they practice their craft and in their beliefs about teaching and learning that underlie those practices. Most teachers are eclectic, choosing from a large repertoire of teaching strategies as the particular situation warrants.*"

2.2. Linking beliefs and teaching approaches

A substantive body of work focuses on conceptions of teaching (Akerlind, 2003; Dall'Alba, 1991; Martin et al., 2002; Prosser & Trigwell, 1999; Trigwell et al., 2002) and on approaches to teaching based on teachers' beliefs (Dunkin, 2002; Entwistle, Skinner, Entwistle & Orr, 2000; Entwistle & Walker, 2002; Kember, 1997; Kember & Kwan, 2002; Samuelowicz & Bain, 2001). These studies have reached a degree of consensus on the way university lecturers conceive teaching and learning. A pattern has emerged ranging from 'transmissive' conceptions, where teaching is seen as imparting information, to 'facilitative' conceptions where the lecturer is concerned with promoting conceptual change in students.

Trigwell & Prosser (1996:277), analyzing interview transcripts with 24 university physics and chemistry teachers from an earlier study, report five approaches to teaching:

- A *teacher-focused* strategy with the intention of transmitting information to students;
- A *teacher-focused* strategy with the intention that students acquire the concepts of the discipline;
- A *teacher-student interaction* strategy with the intention that acquire concept of the discipline;
- A *student-focused* strategy aimed at students developing their conceptions;
- A *student-focused* strategy aimed at students changing their conceptions.

They also report six conceptions that described teaching:

- Transmitting concepts of the syllabus
- Transmitting the teachers' knowledge
- Helping students to acquire teachers' knowledge
- Helping students to acquire concepts of the syllabus
- Teaching students to develop conceptions
- Helping students to change conceptions. (p. 227)

In this analysis they found "*consistency in teachers' conceptions and approaches*" (p. 281).

Kember & Kwan (2000) sought to "*examine the relationship between lecturers' approaches to teaching and their conceptions to good teaching*" and came up with a characterization that described teaching approaches as a set of continua with content-centered and learning-centered poles. They also asked the interviewees about their conceptions of teaching and categorised them as having either teacher- or student-centered orientations. They cross-classified the conceptions of and approaches to teaching. The findings indicate that those

holding teacher-centered beliefs employ content-centered approaches while those with student-centered beliefs use learning-centered approaches, and conclude that "*approaches to teaching are strongly influenced by the lecturer's conceptions of teaching*" (Kember & Kwan, 2000:489). This therefore makes it possible to claim that beliefs about teaching strongly influence the approaches to teaching.

Kember, Kwan & Ledesma (2001) present two main conceptions of good teaching: "*teaching as transmission of knowledge* and *teaching as learning facilitation,"* and identify two subcategories in each. Using a cross-tabulation between the teaching conceptions and the participants' teaching practice, they found "*a high level of correspondence between lecturers' conceptions of teaching and the way in which the teaching accommodated the differing characteristics of adult and other students*" (p. 403).

Samuelowicz & Bain (1992:98-101), in their study of Australian and British lecturers, infer five educational orientations from 'teaching as imparting information' to 'teaching as supporting student learning'. The 'imparting information' orientation reflected the beliefs that students should know more (rather than differently); that the desired knowledge is limited to the curriculum (rather than being a way of interpreting the world); that students' existing understandings are not considered (in contrast to being a reference point for teaching); that teaching is predominantly a teacher-to-student communication (rather than a two-way dialogue); and that the teacher should control the content to be learnt (in contrast to the student having some say in what is studied).

Although there is some debate amongst researchers as to the number of categories, the location of some of them in relation to the teacher-centered as opposed to student-centered poles, and the possibility – or not – of having a transitional category of '*student-teacher interaction*' (Kember, 1997) this body of research has clearly established a consensus around the existence of a number of teaching approaches spread on a continuum between transmissive and facilitative approaches, and the related teacher-centered (traditional) versus student-centered(non-traditional constructivist) approaches to teaching.

The teaching approaches or orientations are expressed (differently) in terms of constituent dimensions. For instance, Samuelowicz & Bain (1992) use five dimensions to delineate their five orientations: *learning outcomes* – knowing more versus knowing differently; *knowledge* – curriculum bound against interpretation of reality; *students' existing conceptions* – taken into account or not; *teaching* – one way transmission versus two-way cooperation; and *content* – teacher-controlled versus student controlled. Samuelowicz (1999) adopted their 1992 work as foundation of her thesis and used same orientations and dimensions in her study.

Entwistle (2003), discussing university teachers' ways of thinking about teaching, notes "*there could be many ways of translating that type of thinking about teaching and learning into practice … the influences on choice of teaching approaches adopted are clearly more complex than any simple model can convey* ."

2.3. Relationship between teachers' beliefs and practice

Few studies have investigated the relationship between lecturers' pedagogical beliefs and their role in university teaching practice (Quinlan, 1997; Bain, 1998; Samuelowicz, 1999). Although some significant progress has been made in these domains in school contexts (Thompson, 1984; Wilson & Wineburg, 1988), university lecturers' typical ways of seeing teaching and learning are still not sufficiently developed to allow for generalizations.

While some researchers (Skott, 2001; Stipek, Givven, Salmon & MacGyvers, 2001) advocate that the influence is from belief to practice, some (Guskey, 1986; Ruthven, 1987) argue that belief is the result of practice rather than a main influence on it. Beliefs are thought to drive actions; however, experiences and reflections on action may lead to changes in and/or additions to beliefs. Thompson (1992) also states that the relationship between beliefs and practices is not a simple cause–effect relationship but is dialectic, and suggests that studies should seek to elucidate the dialectic between teachers' beliefs and practices. According to Richardson (1996:104), "*teachers' beliefs are interactive with their practices. Beliefs are thought to drive actions; however, experiences and reflection on action may lead to changes in and/or additions to beliefs.*" (Tsui, 2003) supports the interaction between teachers' beliefs about teaching and practices and advocates that it is a significant dimension to understand teacher's pedagogical beliefs.

Although labeled a "messy construct" by Pajares (1992:307), beliefs are still considered the *"best indicators of the decisions individuals make throughout their lives … Few would argue that the beliefs teachers hold influence their perceptions and judgments, which in turn, affect*

their behaviour in the classroom …" Kagan (1992:66) cites significant evidence supporting the relationship between teacher beliefs and their decisions about classroom practice: "*Empirical studies have yielded quite consistent findings: A teacher's beliefs tend to be associated with a congruent style of teaching that is often evident across different classes and grade levels.*" Lovat & Smith (1995) suggest that these beliefs also act as mental models driving teachers' practice and processing of new information. Ertmer (2000) emphasises the role that teachers' beliefs play in the adoption and change process, specifically discussing how these beliefs might be addressed through teacher development efforts.

On the other hand, some studies indicated inconsistency between teacher beliefs and practice (Calderhead, 1996; Ertmer, Gopalakrishnan & Ross, 2001; Fung & Chow (2002); Thompson, 1992; Raymond, 1997). For instance, in their study with student teachers in physical education, Fung & Chow (2002:319) found that teachers' espoused views of teaching do not concur with their actual classroom practices. It was found that while the teachers thought themselves to be student-centered in their teaching approach, they were, in actual fact, teacher-centered, acting as transmitters of knowledge and as role models for their students, and thereby assuming the role of subject-matter expert. Ertmer, Conklin & Lewandowski (2001) report that teachers' vision for, or beliefs about classroom technology use did not always match their classroom practices. Despite the fact that most of the teachers described themselves as having constructivist philosophies, they implemented technology in ways that were described as representing a mixed approach which at times engage students in authentic, project-based work and other times asked them to complete tutorials, practice skills and learn

isolated facts. These inconsistencies were attributed to contextual constraints such as curriculum requirements or social pressure exerted by peers and administrators.

On the nature of the interaction between belief and practice, two views are discussed in literature: first, that '*changes in behaviour precede rather than follow changes in belief*' (Fullan, 2001:92), and that '*teachers' beliefs can only be modified while teachers are in the thick of change – taking risks and facing uncertainty*' (Sandholtz et al. 1997, cited in Hoon, 2008). The second and contrasting view is that '*change is influenced by the teachers' ideologies: in other words, by the beliefs and values*' (Sikes 1992:38 cited in Hoon, 2008), that belief "*drives action*" (Gritter, 2005). Taking both views into account, the relationship between behavioural and belief change is ongoing and reciprocal (Fullan 2001), and that it is '*not possible to change one aspect (of the teaching process) without affecting all the others*' (Sikes 1992:38, cited in Hoon, 2008).

Although beliefs are not readily changed, this does not mean that they never change (Nespor, 1987; Pajares, 1992). According to Nespor, beliefs change, not through argument or reason, but rather through a *conversion process or 'Gestalt' shift*. Posner, Strike, Hewson, and Gertzog (1982), (cited in Ertmer, 2005) note that, in order for beliefs to change, individuals must be dissatisfied with their existing beliefs. This is most likely to happen when either existing beliefs are challenged or new beliefs cannot be assimilated into existing ideas. Based on the conceptual change literature, Kagan (1992:77) notes that if a teacher education or professional development program is to be successful at promoting belief change among teachers, "*it must require them to make their preexisting personal beliefs explicit; it must*

challenge the adequacy of those beliefs; and it must give novices extended opportunities to examine, elaborate, and integrate new information into their existing belief systems."

2.4. Beliefs about use of ICTs for teaching and learning

According to Miller et al. (2003) teachers' beliefs about technology are comprised three related but independent components: pedagogical beliefs about teaching and learning, self-efficacy beliefs about technology use, and beliefs about the perceived value of computers for student learning. In a study by Russell et al. (2003) these three components were the main predictors of teachers' classroom technology uses. Although little has been written about how teachers' beliefs about technology are formed, there is little reason to think they follow a path different from that described for other beliefs.

On self-efficacy beliefs about technology use, Ertmer (2005) argues that because few current teachers have experienced, or even observed, the use of technology in their own schooling, they are unlikely to have many preconceived ideas about how technology should be used to achieve student learning. Yet based on the nature of beliefs described above, both inexperienced and seasoned teachers are likely to respond to these new instructional situations by relying on previous beliefs and experiences (Kagan, 1992). Even emerging approaches, instructional technologies, alternative teaching methods, and learning theories are expected to filter through these existing belief systems. Ertmer (2005:30) demonstrates how pedagogical beliefs have a global effect on a teacher's perceptions about new instructional tools and practices when she stated *"Even new information (about technology, alternative teaching methods, etc.), if attended to at all, will be filtered through these existing belief systems*." That

means teachers are likely to think about technology in the same way they think about other teaching methods, tools, or educational reform initiatives, depending on if or how they classify technology into one of these categories. Whereas some teachers may think of technology as just another tool they can use to facilitate student learning, others may think of it as one more thing to do (i.e., an innovation). These early perceptions and classifications, then, result in vastly different beliefs regarding if, when, and how to use the ICT tool.

On beliefs about the perceived value of computers for student learning, previous evidence suggests that, if technology is treated as an instructional innovation, beliefs will play a significant role in whether or how it is adopted and implemented (Cuban, 1986; Czerniak & Lumpe, 1996; Peterson, Fennema, Carpenter & Loef, 1989). Based on the reported relationship between teachers' beliefs and their implementation of reform initiatives, Niederhauser & Stoddart (2001) suggest that teachers use technology in ways that are consistent with their personal beliefs about curriculum and instructional practice. That is, if technology is presented as a tool for enacting student-centered curricula, teachers with teacher-centered beliefs are less likely to use the tool as advocated. Rather, they are more likely to use it, if at all, to support the kinds of traditional activities with which they are comfortable.

In a study exploring differences in USA elementary teachers' uses of technology and their perceptions of the value or role of technology, Ertmer, Addison, Lane, Ross & Woods (1999) found that majority of the teachers perceived technology as an incentive or behavioural reward in order to motivate students to complete their assignments and make lessons more

interesting to students. At the time of the study, the teachers studied were using technology for drill-and-practice activities and as a presentation tool to support their lessons. Almost all uses observed by the researchers, as well as those described by the teachers, involved the application of some type of instructional game or informational CD-ROMs. The study revealed that their integration of technology was mainly related to its usage to employ computers as presentation tools providing additional resources and engaging visuals to enhance lessons, to motivate students and to promote the belief that students need to use technology to be prepared for future employability.

According to Zhao et al. (2002), the further a new practice is from existing practice, the less likely it will be implemented successfully. Given this, instructional technologists might consider introducing technology as a tool to accomplish that which is already valued (e.g., communicating with parents, locating relevant instructional resources). Then, once the tool is valued, the emphasis can switch to its potential for accomplishing additional or new tasks, including those that are supported by broader, or different, beliefs (Ertmer, 2005). For example, once teachers become comfortable using e-mail to communicate with friends, they may be more willing to consider allowing students to use e-mail to communicate with him and peers, an activity that has the potential to influence teacher beliefs about using technology to achieve higher level goals (e.g. authentic writing activities; cross-cultural collaborations; student support).

Newhouse (1998) surveyed 60 Australian teachers and found that even, when teachers had technical skills, they were reluctant to implement technology in their classroom. Teachers

were not convinced about the benefits of computers in education and supported very limited roles of technology in the classroom. The author concluded that one the factors for such resistance was teachers' preference for traditional methods of instruction. Similarly, Mills and Ragan (1998) examined the instructional practices of U.S. 30 elementary teachers in their implementation of educational software in their classrooms. The findings showed that there were substantial differences on the way teachers implemented the innovation. They were also differences in the levels of use of the software which were attributed to different beliefs on the role of the software.

Ertmer (2005:37) draws a direct connection between pedagogical beliefs and technology skills:

> *Given that these [technology] skills are unlikely to be used unless they fit with teachers' existing pedagogical beliefs, it is imperative that educators increase their understanding of and ability to address teacher beliefs, as part of their efforts to increase teachers' technology skills and uses.*

Niederhauser & Stoddart (1994) surveyed 2170 school teachers and found two groups of teachers. The first group associated with the constructivist view believe that computers "*are tools that students use in collecting, analysing, and presenting information"* (p. 2) while the second group associated with the transmission view believe "*that teaching machines that can be used to present information, give immediate reinforcement, and track student progress"* (p. 2). In the former constructivist group, teachers strongly believe that computers can be used as tool to generate knowledge and learn with understanding. Likewise, Becker (2000) investigated beliefs and instructional practices of 4083 middle and high schools teachers and

found that teachers with a higher constructivist inclination towards teaching and learning were more likely to use technology in the classroom. Similar findings were obtained by Fulton & Torney-Purta (2000).

2.5. Theoretical framework

This section discusses methods of research used in the beliefs studies in higher education, the theoretical frameworks for categorizing teacher beliefs and how these informed my choice of methods for this study.

According to Samuelowicz (1999), the studies on the link between teachers' pedagogical beliefs and teaching practice in higher education are conducted using two ways: (1) as case studies in which the two domains (beliefs and practice) are co-described- beliefs method (Quinlan, 1997; Bain, 1998) and, (2) as separate analyses of the two domains which are then related - phenomenographic research (Trigwell, Prosser & Taylor, 1994; Trigwell & Prosser 1996). The phenomenographic methods are aimed at identifying possible ways in which teaching and learning can be conceptualised (Dall'Alba, 1991; Martin & Balla, 1991; Prosser Trigwell & Taylor, 1994.) Samuelowicz (1999) presents a comparison of the two methods in a summary table as shown in Table 1.

Table 1: Comparison of main features of phenomenographic and beliefs methods.

	Phenomenography	'Beliefs'
Research aims	Identification of a range of conceptions of teaching and learning expressed by different academics or the same academic in different contexts (eg. Martin & Balla 1991; Dall'Alba 1991)	Description of educational beliefs and practices (eg. Brickhouse 1990; Smith & Neale 1989)
Data collection	Interviews	Interviews + observations (and in some cases, analysis of relevant documents)
Analysis	Identifying qualitatively different conceptualisations of a phenomenon of teaching from pooled excerpts from interview transcripts (eg. Martin & Balla 1991; Dall'Alba 1991; Prosser, Trigwell & Taylor 1994)	(i) Identifying educational beliefs of individual teachers from the whole interview transcript and analysing whether these match classroom teaching (eg. Brickhouse 1990; Smith & Shepard 1988) (ii) Inferring educational beliefs from the observed practice of individual teachers (eg. Thompson 1984) (iii) Predicting practice of individual teachers from their beliefs (eg. Richardson & Anders 1991)
Unit of analysis	Excerpts immediately relevant to the focal phenomenon	Whole transcripts/all evidence relevant to the domain
Results /categories of description	The range of conceptions of teaching (which are possible, not characteristic, ways of construing teaching)	Typically, case studies which integrate individuals' beliefs and practices (eg. Brickhouse 1990; Smith & Neale 1989) but sometimes separate descriptions of contrasting beliefs and matching practice (eg. Richardson & Anders 1991)

(adapted from Samuelowicz,1999. p.6)

Samuelowicz (1999:6) postulates that both approaches aim at identifying and giving a description of different ways in which lecturers and teachers think about teaching, "the similarity ends there." The concept of pedagogical beliefs focuses on how an individual teacher typically views or thinks and behaves in a particular way. In this study, pedagogical beliefs consist of:

i. Beliefs about teaching (teaching philosophy) which comprises approaches and roles,

ii. Beliefs about how students learn (learning environment, roles)

iii. Beliefs about roles of ICTs in teaching

iv. Beliefs about self-efficacy in the use of ICTs for teaching

These pedagogical beliefs form the dimensions to be measured using the "methods" approach (Samuelowicz, 1999). The "methods" approach aims to investigate thinking characteristic of an individual about a phenomenon. Its line of questioning seeks interpretations of related phenomena using whole transcripts not excerpts. Samuelowicz (1999) notes that in phenomenographic research methodological problems arise especially when conceptions have to be assigned to individuals. The practice often assigns the highest conception expressed by an individual because it is assumed conceptions are hierarchical yet what is critical in understanding the relationship between interpretations of teaching and teaching practice are both typicality and stability of ways of thinking.

The summary given in Table 1 helped me in decide on the suitability of the methods for my study. Given that I seek to understand typical ways in which teaching is seen by individual lecturers and their relationship with practice, the beliefs method is more appropriate to this study than the prevalent phenomenographic approach.

The theoretical framework used for this study is a combination of the "beliefs method" discussed above, and Thompson's (1992) theoretical framework which categorises beliefs as absolutist-traditional beliefs and constructivist non-traditional beliefs including Kember's (1997) 'transitional' belief category bridging the two categories. Traditional belief is "based

on a theory of learning that suggests that students learn facts and concepts and they understand by absorbing the content of their teacher's explanations or by reading an explanation from a text and answering related questions" (Ravitz, Becker & Wong, 2000:1). In terms of practice, traditional practice is rooted in the behaviourist theory where knowledge is viewed as a commodity to be transferred to students whose responsibility is to learn it in a way that is faithful (Gallagher, 1993). Therefore, traditional practice is defined as teacher-centered instruction where teachers plan lessons along with a sequence of content while beliefs about how students learn or the resources needed become a secondary concern (Hoban, 2003).

Constructivist non-traditional belief, in contrast, is "*based on a theory of learning that suggests that understanding arises only through prolonged engagement of the learner in relating new ideas and explanations to the learner's prior knowledge*"(Ravitz, Becker & Wong, 2000). In constructivist belief, knowledge is seen as created rather than received, mediated by discourse rather than transferred by teacher talk, and explored and transformed rather than remembered as a uniform set of positivistic ideas (Holt-Reynolds, 2000). The key notion about constructivism "*is that learning is an active process in which learners construct new ideas or concepts based upon their current and prior knowledge*" (Haylock & Thangata, 2007:35).

Constructivist practice, which is identified as student-centered instruction, primarily focuses on how students learn; thus, students' prior knowledge is taken into account and social interactions with peers and the teacher are structured (Hoban, 2003). In constructivist practice,

teachers are engaged in thinking about their students' understanding of the subject matter, and they think about new practices, such as group work and writing to learn to examine their own teaching and their students' learning (Gallagher, 1993). Constructivism is about students' learning and thus it is important that teachers clearly understand how their students learn in order to be effective (Haylock & Thangata, 2007).

A constructivist classroom is where both teacher and learner initiate and answer questions; learners interact with each other, work collaboratively, are given opportunities by the teacher to think aloud and are intellectually active. It includes teaching activities such as providing non-routine applications of previously learned knowledge and accommodating individual students' interests, needs, and abilities; democratic organisation and management, group tasks. A constructivist learning environment tends to involve activities of the following five types:

- *Projects in which students employ a variety of skills and engage in a diverse set of tasks to accomplish a goal that, even if only implicitly, involves developing their understanding of important content.*
- *Group work—where student tasks involve interdependencies with other students and, in particular, where discourse with other students is facilitated.*
- *Problem-solving tasks: in other words, where the procedural knowledge present for solving a problem is not algorithmic but requires thinking, evaluating, decision-making, and planning as well; and where the definition of the problems themselves may be the responsibility of the student.*

- *Reflective thought through writing. Exposition of a reasoned argument in written form is perhaps the most powerful and most general medium for engaging people with ideas—and with their development of understanding.*
- *A variety of other tasks, in addition to reflective writing, that engage students in meaningful thinking-engaging them in a way that they consider both new information and their own prior understandings and beliefs and attempt to work out syntheses of both the old and the new. Those tasks include, for example, having students make conjectures, eliciting their opinions, having them explicitly work on issues related to their own experiences, and arguing for various points of view*. (Ravitz, Becker & Wong, 2000:4-5).

One challenge facing teachers in creating a constructivist learning environment is that constructivism is a learning theory rather than a teaching description (Fosnot & Perry, 2005). Thus, teachers' conceptualisation of learning theories is important to help them understand the learning process (Reid, 2005) and their roles. However, in any classroom teachers also create their own personal learning theories (McChesney, 2009) and it is vitally important for teachers to understand how students learn. Windschitl (2002) in his theoretical analysis of constructivism practices identifies four dilemmas that concern teachers in creating a constructivist classroom. These include: conceptual (understanding of constructivism), pedagogical (approaches and design demands of constructivism), cultural (between teachers and students collaborations), and political (resistance). Therefore, teaching in a constructivist environment is a demanding job, requiring teachers to understand their students and to structure their teaching (Cooney & Shealy, 1997). The creation of an ideal constructivist

classroom teaching and learning depends very much on the teacher. As Earl (2007:vii) points out, "*teachers are the ones who work directly with students, who translate and shape curricular goals and theoretical ideas into classroom practices and who shape the environment for learning*."

Kember (1997) reviews thirteen studies that attempted to categorise teacher beliefs about teaching and produced a synthesised categorization scheme as shown in figure 1. On the basis his review of literature Kember concluded that there was a high level of agreement between researchers about conception of teaching category schemes. He suggests that a synthesis of the research in the articles reviewed essentially puts conceptions into two categories:

I. teacher-centered/content-oriented

II. student-centered/learning-oriented

He further suggests that each of these two categories has two sub-categories or associated conceptions. The teacher- centered/content-oriented category can be further divided into

a. imparting information

b. transmitting structured knowledge.

The student-centered/learning-oriented category can be further categorised as

a. facilitating understanding

b. conceptual change/intellectual development.

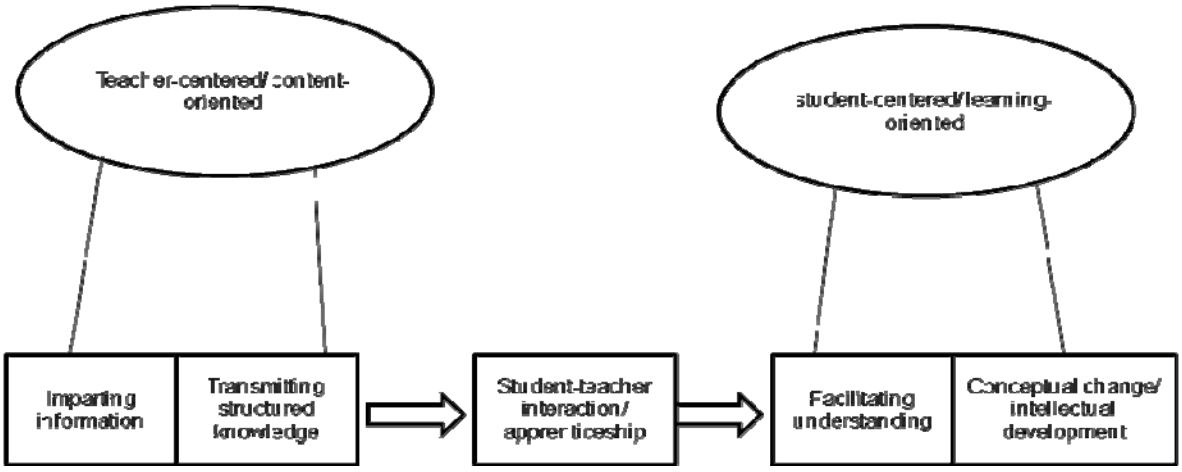

Figure 1: Teachers' beliefs about teaching (Kember 1997)

http://davidtjones.wordpress.com/2009/04/22/

In Kember's multi-dimensional categorisation, two broad high level orientations are represented with two subordinate conceptions each. The boundary between the subordinate conceptions is blurred to indicate that transition across each pair is relatively easy. Within each dimension a continuum exists which represents at one end a teacher-centered content driven belief or practice system and at the other a student-centered constructivist belief or practice system.

The middle conceptual and transitional area is where teacher-student interactions are first recognised as important (Kember, 1997:264). This transitional category was also defined, as applying to beliefs and practices, to imply a movement from being traditional to constructivist. Kember (1997) postulates this transitional category as a bridge between 'teaching-centered/content oriented' and 'student-centered/learning' belief categories and these intermediate categories are defined as "*teacher-student interaction.*" Though the transitional category is not an easy one to notice, it is inevitable. It is the nature of the teacher-

student interaction that determines whether teaching is either transmitting information or facilitating learning. The five categories are portrayed in a continuum with distinct borders to imply that a shifting in beliefs is possible and does happen in some cases.

Hence, this study examined and analysed lecturers' beliefs about teaching in these three categories: absolutist-traditional, transitional, and constructivist non-traditional using the beliefs method. Additional descriptors emerged during data analysis, close to constructivist and close to traditional.

2.6. Summary of chapter

This chapter reviewed existing literature pertinent to this study. The literature focuses mainly on the main elements of the research questions which include teacher pedagogical beliefs, teacher beliefs about technology use in teaching and learning, and the link between these beliefs and practice in general and use of ICTs in actual teaching. Examination of teacher pedagogical beliefs included discussion on definitions and labels used for beliefs and teacher beliefs; relationship between teacher beliefs and practice; teacher beliefs about use of ICTs for teaching and learning. A theoretical framework for this study is then discussed.

CHAPTER THREE

3. METHODOLOGY

Generally research methodology includes the processes, principles and procedures adopted to approach problems and determine solutions (Bogdan & Taylor, 1975). This chapter describes the study approach, design procedures and ways used to ensure validity and reliability of data, ethical procedures, survey and interview protocols, the participants and the treatment of the data collection procedures.

3.1. Study approach

The study adopts a qualitative multi-case study approach with an interpretivist perspective as this was the methodology best suited to the nature of the research questions. In this study, qualitative research helped in detecting the distinction of attitudes and behaviour that revealed things that would not be otherwise. Qualitative research is research that derives data from observation, interviews, questionnaires and verbal interactions and focuses on the meanings and interpretations of participants. This gives a fuller and deeper understanding of the study at hand. According to Krathwohl (1993), qualitative research methods permit description of the phenomena and events in an attempt to explain and understand them. The multi-case study approach was used in order to focus on a belief–practice relationship of the lecturers. A case study is a detailed examination of one setting, or a single subject, a single depository of documents, or one particular event (Bogdan & Biklen, 1998:54). When two or more subjects, settings, or depositories of data are studied, it is called a multi-case study (Bogdan & Biklen, 1998).

The data collected in a qualitative multi-case study includes more than words; attitudes, feelings, vocal and facial expressions, and other behaviours are also involved. In this study, data consist of survey responses, interview transcripts, notes from observations. These were treated to rigorous ongoing analysis. Three processes were blended throughout the study: collection, coding, and analysis of data. This approach encourages the kind of flexibility so important to the qualitative researcher who can change a line of inquiry and move in new directions, as more information and a better understanding of what are relevant data are acquired (Blumer, 1969). These important perspectives presented by qualitative researchers provided the foundation for my own research methodology.

The study involved a preliminary descriptive examination of the lecturers' typical pedagogical beliefs, beliefs about ICT use for teaching and learning, followed by linkages between these beliefs and the actual use of ICTs in teaching. As an interpretivist, my assumption in the study is that there are multiple realities, characterised by complex behaviours (MacMillan, 2008).
The study was limited to six lecturers teaching online EMBA programme courses because the programme is the university's pilot programme for online distance learning project and also because of the availability of participants during study period.

3.2. Research design

Leedy (1989:218), defines research design as, "… the total architectural plan, the tectonic structure of the research framework." It is a description of the format and theoretical structure under which the study was carried out. A descriptive survey was used in this study. Leedy (1985: 61) describes a descriptive research as, "*The method of research that looks with intense*

accuracy at the phenomena of the moment and describes precisely what the researcher sees." In this case the seeing is not restricted to the physical vision but to the many ways of seeing or looking used in research, such as through a questionnaire, interview, observation or examination of records and reports to collect data. Another advantage of a descriptive research, according to Gwimbi & Dirwai (2003:59), is the use of "qualitative research" which is inductive and the use of known quantitative facts.

This section describes the general plan and processes used for the study. The design framework (Figure 2) encapsulates the study focus, the main elements (literature review), the study approach and design, the data procedure and finally the results.

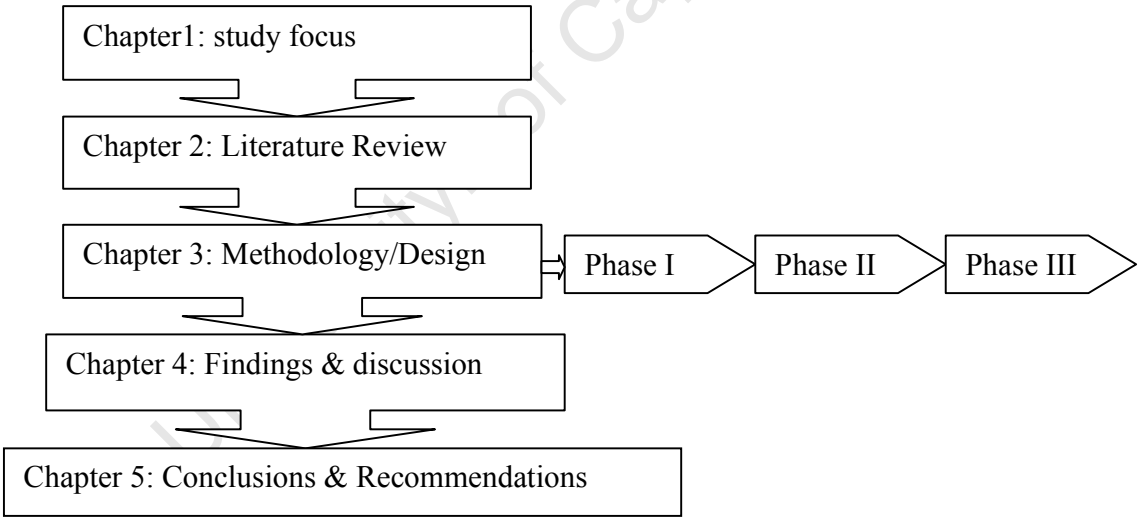

Figure 2: Study design framework

Phase I of the design constituted a preliminary survey aimed at identifying the respondent lecturers' pedagogical beliefs about teaching and learning. The findings would be used to categorise the lecturers for further study and analysis in subsequent phases.

In Phase II the respondents were interviewed using semi-structured interviews to determine their beliefs about the relevance and use of ICTs in teaching. The data collected were analysed together with the Phase 1 survey responses to identify any inferences, inconsistencies, contradictions and key themes derived from the data.

In Phase III one most interesting lecturer's use of CLMS technologies in actual teaching practice was observed. Data were collected using a combination of direct observation, analysis of CLMS technologies and some interview techniques to solicit and access the participating lecturer's (Phil) belief system and technology practices reflected in the course site on Moodle CLMS. All the findings from the three phases were analysed and discussed and conclusions were made accordingly.

3.2.1. Setting

The research study was set in Africa University's Maputo pilot project. The satellite Centre is located at the United Methodist Mozambique Annual Conference offices in Maputo. The satellite campus serves as the link between Africa University campus and the online learners enrolled on the online EMBA programme. The student population is a mix of Mozambicans and immigrant Zimbabweans residing in different parts of Mozambique. According to the University website, the EMBA programme description states the objectives as:

> The EMBA is designed:
>
> "*to enhance the managerial and analytical skills of African Managers in both the public and private sectors. It incorporates both a thorough grounding in the basics of current business practice and theory in each of the functional areas of business*

(accounting, finance, management, and marketing), as well as leading edge knowledge in more specialised topics such as entrepreneurial skills, small business management, global business, and public policy analysis.

The programme prepares students to take a leading role in creating, managing and directing private businesses, and leading governmental and non-governmental organisations in the public sector."

http://www.africau.edu/mozambique/embadescription.html

The programme is offered on modular-basis online with a face-to-face weekend revision and examination preparation session at the end. It consists of eight (8) modules of instruction each with two (2) courses. Provided that only a certain amount of material can be covered during the F2F session, blended learning emerged as an ideal option for enriching the course content by means of online resources. Moodle, the already adopted free and open source web application, is used as the CLMS to host the course. Five types of online resources were mainly used by most lecturers: (a) course resources (lecture notes, scholarly papers, guidelines, schedule, web links), (b) course assignments (instructions, examples, self assessment questions, academic paper), (c) discussion and news forum (for course news, notices, queries, discussions and other activities), emails (for general student support, queries and feedback) and (d) Instant messaging (for real-time queries and feedback).

3.2.2. Participants

Preliminary survey was sent to eight Faculty of Management and Administration (FMA) full time lecturers teaching EMBA courses to determine their pedagogical beliefs. This was due to availability of the participants. I chose to study only the full-time lecturers in this programme because part-timers were hardly accessible outside their scheduled classes and also that they often moved a lot due to economic-related push factors.

Six out of eight (75%) lecturers (Tom, Leo, Joe, Don, Lisa and Phil - pseudonyms) responded to and returned their surveys and from the surveyed six (6), three (Tom, Leo and Phil) were sampled representative to the identified beliefs categories to participate in Phase 2. These three were then interviewed using semi-structured, open-ended and non-formal interviews.

One participant (Phil) who proved to have the most interesting belief mix from both studies was further observed during his online teaching practice to determine consistency of survey and interview results. This constituted Phase 3.

3.3. Methods:

For this study I used three data collecting methods: a survey, semi-structured interviews and direct observation. Davidson & Tolich (1999:34) (cited in Kane, Sandretto & Heath, 2002), advocate that "*the heart qualitative research's validity*" is the use of multiple data sources and research methods which allow the researcher to view the focus of inquiry from several vantage points. Several reviewers in the area of teacher beliefs have noted the importance of using multiple methods of data collection and multiple methods to investigate teacher beliefs (Richardson 1996; Lincoln & Guba both cited in Kane, Sandretto & Heath, 2002).

According to Kagan (1990:459), (as cited in Kane, Sandretto & Heath, 2002), "*the use of multi-method approach appears to be superior, not simply because they allow triangulation of data but because they are more like to capture the complex, multifaceted aspects of teaching and learning.*"

Thompson (1992) emphasised that inconsistencies between professed beliefs and observed practice could also be explained in part by the way teachers' beliefs were measured. Judson (2006) concurs with this notion when she states, "*Unfortunately, much of the research to date has relied on self-reported data from teachers and this type of data too often presents a less than accurate picture*." Instead she proposes, "*Versus self-reported practices, direct observations that gauge the constructivist manner in which teachers integrate technology are a more precise, albeit protracted, measurement.*"More so, the survey method has been criticised as being "*too constraining*" and not validly representing teachers' beliefs (Richardson, 1996). In order to prevent any inconsistency between beliefs and practices because of the measurement, there was an attempt to use data from different sources to develop a detailed composite description of the lecturers' beliefs and practices.

3.3.1. The Survey

A survey was used to determine the six online EMBA lecturers' pedagogical belief orientations (related to classroom environment, teaching activities, teacher role, curriculum goals, use of ICTs, etc.). The survey instrument was adopted from the revised and validated Teacher Belief Survey (Benjamin, 2003; TBS) originally designed by Wooley & Wooley (1999). The TBS instrument was designed to assess teachers' beliefs related to constructivist and behaviourist theories of learning. I customised the instrument to suit university lecturers

and removed some items that dealt with school-related teaching practices. The customised instrument comprised forty-two items in a six-point Likert scale. The responses were strongly agree, agree, somewhat agree, somewhat disagree, disagree and strongly disagree. A six-point scale forces the respondents to give their response because it does not allow for indifference.

The TBS instrument comprised statements that represented four belief constructs: constructivist teaching (14 statements); constructivist management (11 statements); behaviourist teaching (10 statements); and behaviourist management (7 statements). The statements appeared in random order in the survey questionnaire (Appendix 3: Lecturers' pedagogical beliefs survey).

The first section of the TBS comprising 8 questions on demographic information and related questions helped me to examine the respondent's social context, as this may be an influential factor on one's belief system construction.

3.3.2. Semi-structured interviews

After determining the participants' responses in the four categories, three cases of lecturers, (each representing the identified range of pedagogical beliefs) were selected as representatives of the results. These lecturers were interviewed using semi-structured interviews in order to determine their views about teaching, role of ICTs in teaching and learning, and the intersection between these beliefs and actual practice. My preference of a semi-structured interview over other methods was because of the opportunity to be close to the participants during the face-to-face interview dialogues and that "*beliefs cannot be directly observed or*

measured but must be inferred from what people say …" (Pajares, 1992:314). Asking open-ended questions is crucial in qualitative interviewing since it allows respondents to respond in their own words (Bogdan & Biklen, 1998; Patton 1987).

All one-on-one interviews were pre-arranged a week in advance with times and venues determined by the interviewee at their convenience, and were tape-recorded and transcribed directly after the interview. Each interview varied in length from 25 minutes to one hour. The research questions and sub-questions were used to develop the interview protocol (Appendix 3). The participants were i) informed about the aim of the study and the methodology to be used, ii) given the opportunity to ask questions about the study to ensure their comfort and to give honest and open responses, iii) interviewed using semi-structured interview questions.

3.3.3. Observation of Content Learning Management System practice

Of the three participating lecturers, one (Phil) participant who proved having a transitional belief mix, was observed during online teaching practice (content presentation, visibility in online classroom activities, types of CLMS features used in courses, etc.) to determine consistency between data from survey and interview. Phil allowed me to get into his online course as "non-editing teacher" in which I observed and recorded his online teaching practice after walking me through his online course.

Data gathering in this stage was conducted using mainly the observable reports from the CLMS (Moodle) consisting types of resources and activities like discussion threads, types of assignments given, grade book, and other learning design tools offered by the CLMS. It was

beyond this study to analyse the quality of online class discussions, wiki contributions, journal entries, etc. therefore, "use" of an online resource was operationalised through "availability" of an online resource in the course. It is obvious that the lecturer made available those resources he believed would enhance students learning. Therefore, this study is limited to resource presence as it was not possible to know the quality of the content that students contributed, how each tool or feature impacted on students' learning, or what their understanding of the resource was. Nevertheless, making a resource available in a course is a definite prerequisite to using the resource and it is sufficient for the purposes of this study.

Use of tools such as groups and group tasks, class projects, electronic journals, wikis, e-portfolios and discussion forums, quizzes, offline tests, different types of assignments helped determine whether the online classroom was a constructivist or a replica of a traditional learning environment.

3.4. Research Ethics

An informed consent and approval (Appendix 2: Informed consent) from each of the targeted research participants was sought. The participants have reasonable and sufficient knowledge about me as a work colleague, my study background and therefore do understand my research intentions mainly from work-related interactions. Therefore a formal letter of introduction and purpose of research was sent to each participant, together with the request for their informed consent. I gave them more information about what my research study entails and how they were to be involved. I did not withhold any information from the research participants and I offered privacy and confidentiality assurance to the participants if they wish to remain

anonymous by giving and abiding by the promise that all gathered data were to be used solely for the study and no unauthorised third parties would be given the data. As there is no research ethics committee, at AU, approval was sought from the School of Education at University of Cape Town.

3.5. Summary of chapter

The chapter discussed the study approach and design, the methods used and the research ethics. The study adopted a qualitative multi-case study approach with an interpretivist perspective given the nature of the research questions. The research study was set in Africa University's Maputo EMBA pilot project. The participants were six lecturers who teach in the pilot programme and the data collection methods used were a survey, semi-structured interview and observation of online teaching practice. The study was undertaken in three phase in which a different instrument was used to gather the data and the participants were selected accordingly from the six. The chapter ended with description of how research ethics were treated.

CHAPTER FOUR

4. FINDINGS AND DISCUSSION

Overview

This chapter presents the results and findings of the study. The four sub-questions framed the data collection and analysis thereby helping shape this chapter. The arrangement of the chapter follows three phases of data collection and analysis:

i. Phase 1: Preliminary identification of lecturers' pedagogical beliefs
ii. Phase 2: Determination of lecturers' beliefs about the relevance and use of ICTs in teaching
iii. Phase 3: observing use of CLMS technologies in actual teaching practice.

The sub questions of the study focused on (i) lecturers' beliefs about teaching (teaching philosophy, role of lecturer, classroom management); (ii) lecturers' beliefs about the relevance and role of ICTs in teaching and learning; (iii) the relationship between the teaching beliefs and beliefs about role of ICTs, and (iv) how lecturers' beliefs were reflected in use of ICTs in actual teaching practice. A partial analysis of data collected in Phase 1 is conducted in order to identify the belief constructs representation in the sampled participants. The findings in this phase guided the selection of participants for phase 2. Analysis of data collected in each of the subsequent two phases ended with discussion of the overall findings in that phase and links them to the findings in the preceding phase(s). The chapter ends with an overall discussion on the findings in this study.

4.1. Phase1: Preliminary identification of pedagogical beliefs held by lecturers

The aim of Phase 1 was to identify pedagogical beliefs, held by the respondent lecturers, about teaching and learning so that I would be able to categorise the lecturers for further analysis in subsequent phases. This section reports the findings from the teachers' beliefs survey (TBS) instrument (see Appendix 3). The instrument was divided into two parts: Part A asked the respondents to enter their personal details and Part B formed the beliefs survey. Part B consisted of forty-two statements to which respondents were requested to indicate their degree of agreement or disagreement. The statements represented the four belief constructs (constructivist teaching, constructivist management, behaviourist teaching and behaviourist management) which appeared in a random order.

Six respondents completed the survey questionnaire. All respondents were lecturers from the Faculty of Management and Administration teaching both undergraduate and graduate courses. All respondents taught at least one course on the university's pilot online EMBA programme in addition to other campus courses.

4.1.1. Results

4.1.1.1. Demographics of respondents

In terms of gender, the respondents were unevenly distributed, five males and one female although the university has a fairly balanced staff complement. All the lecturers were at the lecturer level and had worked at the institution for more than two years. 5 of the respondents were older than 30 years with Africa university tenures ranging from less than 3 to above 5 years see Table 2

below.

Table 2: About the Lecturers

Gender			Age		
	Count	%		Count	%
Female	1	17%	<30	1	17%
Male	5	83%	31-40 years	2	33%
			41-50 years	2	33%
			>50 years	1	17%
Language of instruction during schooling			Years with the university		
	Count	%		Count	%
English	5	83%	<3	1	17%
French	1	17%	3-4 years	1	17%
			4-5 years	1	17%
			>5 years	3	50%

4.1.1.2. Captured data from the Teacher Beliefs Survey questionnaire

Given that the aim of Phase 1 of the study was to determine pedagogical beliefs typical of each individual lecturer, the initial analysis comprised grouping the survey response items into the four belief constructs, calculate the frequency of each response per construct, categorise each lecturer as constructivist, behaviourist or both depending on which construct(s) he/she agrees to.

The analyses were done using Microsoft Excel. The qualitative data from the TBS instrument was captured electronically using number codes assigned to each response (6='strongly agree'; 5='agree'; 4='somewhat agree'; 3='somewhat disagree'; 2='disagree'; 1='strongly disagree' and 'no response') as associated with each response item (Appendix 1: Survey Results). This was then analysed in Microsoft Excel.

4.1.2. Analysis

After grouping the Likert scale items into the four belief constructs, the "Find" function was used to search for the occurrence of the assigned codes for each lecturer. Percentages were calculated to help decide to which belief construct was the lecturer most agreeable. To further analyse and understand the categories, I combined all the "agree" percentages (from strongly agree to somewhat agree) and also the "disagree" percentages accordingly see Table 3 below.

It is worth noting, that while lecturers' beliefs and practices may be characterised by the continuum, it is unlikely that they can be pinpointed on it. It is my opinion that beliefs and practices may span an area of the continuum. Lecturers' implicit and explicit beliefs and practices may also be more dynamic than static as alluded in Pratt's (1992) definition of 'teaching approach' as 'a dynamic and interdependent trilogy of actions, intentions and beliefs' (p. 206). A pseudo-name was assigned to each lecturer to allow for anonymity.

Table 3: Lecturers' agreement and disagreement to the four belief constructs

	Constructivist Teaching		**Constructivist Management**		**Behaviourist Teaching**		**Behaviourist Management**	
	Agree	***Disagree***	***Agree***	***Disagree***	***Agree***	***Disagree***	***Agree***	***Disagree***
Joe	93%	0%	100%	0%	90%	10%	57%	43%
Phil	93%	7%	100%	0%	100%	0%	86%	14%
Tom	72%	29%	91%	10%	90%	10%	29%	71%
Leo	71%	28%	46%	55%	60%	40%	72%	29%
Lisa	93%	7%	100%	0%	60%	40%	71%	29%
Don	100%	0%	82%	18%	60%	40%	43%	57%

4.1.2.1. Joe

Joe strongly agreed to 71% constructivist teaching and 73% constructivist management items as compared to 40% behaviourist teaching and 29% behaviourist management items respectively, as illustrated in Table 4 below.

Combining the response scales into “agree” and “disagree” for further analysis of Joe agreed to 93% constructivist teaching, 100% constructivist management, 90% behaviourist teaching and to 57% behaviourist management items (Table 3). This shows that Joe almost equally held both constructivist and behaviourist teaching beliefs and more constructivist management beliefs than behaviourist management beliefs. Given that Joe held both constructivist and behaviourist beliefs, with constructivist beliefs predominating, he could not fit into the predefined constructs and was therefore categorised as close-to-constructivist.

Table 4: Joe's results

	Constructivist Teaching		Constructivist Management		Behaviourist Teaching		Behaviourist Management	
	Count	%	Count	%	Count	%	Count	%
Strongly agree	10	71%	8	73%	4	40%	2	29%
Agree	3	21%	3	27%	2	20%	0	0%
Somewhat agree	0	0%	0	0%	3	30%	2	29%
Somewhat disagree	0	0%	0	0%	0	0%	0	0%
Disagree	0	0%	0	0%	1	10%	3	43%
Strongly Disagree	0	0%	0	0%	0	0 %	0	0%
No response	1	7%	0	0%	0	0 %	0	0%

4.1.2.2. Phil

Phil strongly agreed to 29% constructivist teaching, 27% constructivist management, 10% behaviourist teaching and to 0% behaviourist management items as illustrated in Table 5 below.

Combining the response scales into “agree” and “disagree” for further analysis of Phil agreed to 93% constructivist teaching, 100% constructivist management, 100% behaviourist teaching

and 86% behaviourist management statements (Table 3). This shows that Phil almost equally held both constructivist and behaviourist pedagogical beliefs. Given that both constructivist and behaviourist beliefs almost equally existed, Phil was therefore categorised as transitional.

Table 5: Phil's results

	Constructivist Teaching		**Constructivist Management**		**Behaviourist Teaching**		**Behaviourist Management**	
	Count	%	Count	%	Count	%	Count	%
Strongly agree	4	29%	3	27%	1	10%	0	0%
Agree	6	43%	6	55%	4	40%	3	43%
Somewhat agree	3	21%	2	18%	5	50%	3	43%
Somewhat disagree	1	7%	0	0%	0	0%	0	0%
Disagree	0	0%	0	0%	0	0%	1	14%
Strongly Disagree	0	0%	0	0%	0	0 %	0	0%
No response	0	0%	0	0%	0	0 %	0	0%

4.1.2.3. Tom

Tom strongly agreed to 14% constructivist teaching, 9% constructivist management, 20% behaviourist teaching and to 0% behaviourist management items as illustrated in Table 6 below.

Combining the response scales into “agree” and “disagree” for further analysis of Tom agreed to 72% constructivist teaching, 91% constructivist management, 90% behaviourist teaching and 29% behaviourist management statements (Table 3). This shows that Tom held both constructivist and behaviourist pedagogical beliefs with constructivist beliefs in majority. This means that Tom agreed more to constructivist themes than behaviourist and was therefore categorised as close-to-constructivist.

Table 6: Tom's results

	Constructivist Teaching		**Constructivist Management**		**Behaviourist Teaching**		**Behaviourist Management**	
	Count	%	Count	%	Count	%	Count	%
Strongly agree	2	14%	1	9%	2	20%	0	0%
Agree	6	43%	4	36%	4	40%	1	14%
Somewhat agree	2	14%	5	46%	3	30%	1	14%
Somewhat disagree	3	21%	1	9%	0	0%	4	57%
Disagree	1	7%	0	0%	1	10%	1	14%
Strongly Disagree	0	0%	0	0%	0	0 %	0	%
No response	0	0%	0	0%	0	0 %	0	%

4.1.2.4. Leo

Leo strongly agreed to 36% constructivist teaching, 9% constructivist management, 40% behaviourist teaching and to 43% behaviourist management items as illustrated in Table 7.

Table 7: Leo's results

	Constructivist Teaching		**Constructivist Management**		**Behaviourist Teaching**		**Behaviourist Management**	
	Count	%	Count	%	Count	%	Count	%
Strongly agree	5	36%	1	9%	4	40%	3	43%
Agree	2	14%	2	18%	1	10%	1	14%
Somewhat agree	3	21%	3	27%	1	10%	1	14%
Somewhat disagree	2	14%	1	9%	2	20%	1	14%
Disagree	1	7%	4	36%	1	10%	1	14%
Strongly Disagree	1	7%	0	0%	0	0 %	0	%
No response	0	0%	0	0%	1	10 %	0	%

After combining the response scales into “agree” and “disagree” for further analysis it was clear that Leo agreed to 71% constructivist teaching, 46% constructivist management, 60% behaviourist teaching and 72% behaviourist management statements (see Table 3). This

shows that Leo held both constructivist and behaviourist pedagogical beliefs with behaviourist beliefs in majority. This means that Leo agreed to more behaviourist than constructivist themes and was therefore categorised as close-to-behaviourist.

4.1.2.5. Lisa

Lisa strongly agreed to 64% constructivist teaching, 55% constructivist management, 30% behaviourist teaching and to 0% behaviourist management items as illustrated in

Table 8 below.

On combining the response scales into “agree” and “disagree” for further analysis it was shown that Lisa agreed to 93% constructivist teaching, 100% constructivist management, 60% behaviourist teaching and 71% behaviourist management statements (see

Table 3). This shows that she held both constructivist and behaviourist pedagogical beliefs with predominant constructivist belief statements. This means that Lisa agreed more to constructivist themes than behaviourist and was therefore categorised as close-to-constructivist.

Table 8: Lisa's results

	Constructivist Teaching		**Constructivist Management**		**Behaviourist Teaching**		**Behaviourist Management**	
	Count	%	Count	%	Count	%	Count	%
Strongly agree	9	64%	6	55%	3	30%	0	0%
Agree	3	21%	3	27%	1	10%	2	29%
Somewhat agree	1	7%	2	18%	2	20%	3	43%
Somewhat disagree	1	7%	0	0%	4	40%	2	29%
Disagree	0	0%	0	0%	0	0%	0	0%
Strongly Disagree	0	0%	0	0%	0	0 %	0	0%
No response	0	0%	0	0%	0	0 %	0	0%

4.1.2.6. Don

Don strongly agreed to 14% constructivist teaching, 18% constructivist management, 0% behaviourist teaching and to 0% behaviourist management items as illustrated in Table 9 below.

Combining the response scales into “agree” and “disagree” for further analysis of Don agreed to 100% constructivist teaching, 82% constructivist management, 60% behaviourist teaching

43% behaviourist management statements (see

Table 3). This shows that Don held both constructivist and behaviourist pedagogical beliefs with constructivist beliefs in majority. This means that Don agreed more to constructivist themes than behaviourist and was therefore categorised as close-to-constructivist.

Table 9: Don's results

	Constructivist Teaching		**Constructivist Management**		**Behaviourist Teaching**		**Behaviourist Management**	
	Count	%	Count	%	Count	%	Count	%
Strongly agree	2	14%	2	18%	0	0%	0	0%
Agree	10	71%	6	55%	3	30%	1	14%
Somewhat agree	2	14%	1	9%	3	30%	2	29%
Somewhat disagree	0	0%	2	18%	3	30%	0	0%
Disagree	0	0%	0	0%	1	10%	3	43%
Strongly Disagree	0	0%	0	0%	0	0 %	0	0%
No response	0	0%	0	0%	0	0 %	1	14%

4.1.3. Summary of Phase 1

The coding and analysis above indicated that none of the participating lecturers was in the extreme absolutist-traditional or constructivist non-traditional categories. They instead

believed in a mixture of both traditional and constructivist teaching and management approaches although some maybe more inclined towards either extremes. This led to the emergence of additional close-to-constructivist and close-to-traditional descriptors.

This means that the collected data was analysed using five belief constructs:

- *Traditional*: agreed to all traditional items and disagreed to all constructivist items ;
- *Close-to-traditional:* agreed to most traditional items and to some constructivist items.
- *Transitional:* agreed to equal percentages of constructivist and traditional items.
- *Close-to-constructivist:* to most constructivist items and to some traditional items.
- *Constructivist:* agreed to all constructivist items and disagreed to all traditional items.

The results indicated that four out of six (67%) participants were ranked as close-to-constructivist, one out of six (17%) ranked as transitional and another one out of six (17%) was ranked as close-to-traditional.

This helped me select three participants for further probing in phase 2 below. Representative of the three represented categories, I selected the participants for Phase 2: Phil represented the transitional; Leo the close-to-traditional and Tom represented the close-to-constructivist category.

4.2. Phase 2: Determining lecturers' beliefs on use of ICTs in teaching

Based on the preliminary survey analysis, but before completion of a full analysis, three lecturers were identified as potential candidates for case studies in Phase 2. They were selected as case participants based on the representation of the belief categories in Phase 1,

my day-to-day interactions and observations of their ICT usage in teaching, as well as their availability for interviews in the first semester (August to December 2010). These case participants were interviewed using semi-structured interviews and the data collected was analysed together with the Phase 1 survey responses to identify any inferences, inconsistencies, contradictions and key themes derived from the data.

The participants were case1: Tom – close to constructivist, case 2: Phil – transitional and case 3: Leo –close to traditional. All cases were male. Their summary profiles drawn from how each carried himself around, survey results and informal interactions as workmates were as follows:

> *Tom*, was a very energetic and hardworking young man. He was very eager to learn and try out new things. He regularly attended staff development programmes and was always championing initiatives to integrate new ways of teaching. From the survey, Tom joined Africa University some three and a half years ago and was ranked as close-to-constructivist.
>
> *Phil*, was a seasoned teacher with teaching qualification and diverse teaching experiences. He taught quantitative and numerical subjects and believed very much gradual integration of new teaching methods and approaches. Phil enjoyed learning new things but it always has to be with his age-mates and not a mixed group. He was with the University since 1999 and has participated in the curriculum design and development of most Faculty of Management and Administration degree programmes.

He was very influential in the inception of the pilot distance learning initiative. In the preliminary survey, Phil was ranked as transitional.

Leo, is an international lecturer with six years university teaching experience. He was generally an introvert who rarely participated in university-organised staff development programmes. He preferred one-on-one consultations with support staff in any areas of concern and diligently followed given steps. In the survey Leo was ranked as close-to-traditional.

4.2.1. The Interviews

All cases were interviewed between October and November with each interview lasting approximately one hour, ranging from 45 minutes to 1 hour 20 minutes. All were interviewed in the TV Studio in the ICT Building during their free periods on work days. I conducted all the interviews. I began the interviews with giving participants background information on the study and the purpose of the interviews. Participants were encouraged to be open and candid in their responses and were assured anonymity for reporting purposes. Each interview followed a semi-structured interview protocol (Appendix 4) but participants were invited to expand on their responses as much as they felt comfortable. I typed the responses on my laptop verbatim and tape recorded the interviews. Each interview transcription was reviewed, spell-checked and organised within a few days of it being conducted.

After the review, each participant's interview was compared with his survey responses and a new summary profile was written for each participant. The profiles were reviewed and a series of key themes were identified in relation to the research questions.

4.2.2. Results and analysis

In order to make sense of the collected data from both the preliminary survey and the semi-structured interviews, the written and transcribed responses were read several times and categorised into five main categories adapted from a combination of Thompson (1992) and Kember (1997) studies. In these studies beliefs were categorised as:

Absolutist traditional: The beliefs of lecturers in this category were predominantly traditional regarding all aspects of teaching. These lecturers believed their role was to present facts and concepts to the students in a quiet classroom in which they were listened to by their students. They also believed in students reproducing learnt concepts in tests, assignments and examinations. They were content-centered and wanted their students to follow textbook and syllabi offerings diligently.

Transitional: The beliefs in this category were a mixture with equal existence of absolutist-traditional and constructivist. They were inconsistent, for instance, they believed in the student-centered teaching approach but preferred traditional assessment methods. A lecturer might at the same time hold both traditional and non-traditional beliefs about the teaching approach.

Constructivist non-traditional: The beliefs in this category were predominantly constructivist. The lecturers in this category viewed their role as to facilitate learning, guiding and supporting the student. They believed in student-centered teaching approach where the interaction and collaboration among students is an essential element in knowledge construction. These believe knowledge is constructed rather than acquired or received.

Non-codeable responses: These were responses that could not fit in any of the above categories. These were categorised as "non-codeable ." For Instance statements such as , "I am not sure if I can answer this question but I think there are many effective teaching approaches and all one needs is to consider all relevant issues before employing any of the methods."

Analysis of the data indicated that the three lecturers held mixed beliefs about teaching with ICTs in general. The results are reported below in terms of the investigated aspects of teaching; the lecturers' teaching philosophy, the role of the lecturer, the role of ICT in teaching and classroom environment.

A summary of the lecturers' beliefs and use of ICTs in practice is displayed in Table 10 below:

Table 10: Lecturers' pedagogical beliefs summary

	Tom	Leo	Phil
Teaching philosophy	• Student-centered • Flexibility is key • Collaborative learning • Knowledge construction • Guided by planned curriculum • Allows for experimental and experiential learning	• Content-centered • Students learn through drill and memorization • Teach for recalling • Knowledge transmission • Explain topic content	• Collaborative group tasks • Expansive learning • Students' discussions and diverse opinions • learning tasks put into small sequential steps • Give students as much information rather than leave them to experiment
Role of lecturer	• Guide and support • Co-inquirer with students • Facilitate critical student enquiry • Encourage research and guidance for peer evaluation	• Transmit knowledge • guide to ensure syllabus and curriculum are followed • Ensure students pass exams • Curriculum goals keeper and regulation enforcement	• Ensure planned content is covered • Guide students learning • Manages the teaching and learning process • Content expert • Goals keeper • Research and plan before hand
Choice of learning activities	• Depends on students prior	• Curriculum-centered	• Uses the planned curriculum,

	knowledge and skills • Accommodates students' study interests • Open-ended assessment techniques • Course exam requirements	• Pre-course planning before meeting students • Use of concrete examples and cases to ease students recalling • Providing multiple questions	university regulations and expectations • Results of assignments and exercises • Real life case studies • Use concrete examples • Students experiences ad expectations guide choice of tasks.
Role of ICTs in teaching and learning	• Pre-course survey • Increase student motivation • Extension of F-2-F interactions • Tool for expansive and collaborative learning • Enhance learning of the subject matter • The short cycle in technology evolution is quite	• Technology disrupts learning • Confuses students • ICTs are for the elite and privileged few • Imposed on lecturers with no other option • Technical issues are de-motivating • Most ICTs need a lot of re-skilling at the	• Useful tools for planning lectures • Creates or widens the gap between the "haves and have not's" • Helps the slow learners as extension tutors • eLearning breaks boundaries and takes education to the excluded like the physically challenged

	disruptive.	expense of preparing for quality lecture delivery • Discourage late adopters as there is always something emerging /new before grasping the old.	• Infrastructural challenges more disrupting than F2F issues • Provides visual appreciation of phenomenon being learnt
Classroom environment	• More discussion and student participation. • Collaborative effort essential • Open-ended discussion topics and question allow for deeper learning. • Theatre-type lecture rooms quite limiting	• Lecture-type effective • Notes dictation • Quiet and aims to finish the syllabus on time • Individual assignment effective for evaluating progress. • Students to comply with my authority and meet strict deadlines	• Pre-lecture preparation by students • Online classroom more interactive for students at a distance • Learning is more effective if it is a two way process • Students need rules and guidelines if they are to pass exams • Penalties for failure to submit work as specified.

Lecturers' teaching philosophy: 2 out of 3 had mixed beliefs about teaching. They both criticised lecturers who thought they were masters of the content/subject matter and took students as empty receptacles of knowledge. Tom, for instance, believed instruction should be planned along the sequence of content as laid down in the curriculum. He gave his explanation as; "*Uuhm, teaching in university is driven by the curriculum objectives and I believe learning activities should be planned along the laid down sequence of content. In as much as I believe students should be given room to negotiate their learning process, I believe curriculum-oriented approaches are more productive."* This means that his design of learning activities had to be guided by the curriculum, a view that is consistent with the traditional view of teaching as Hoban (2003) states; traditional beliefs are teacher-centered instruction where teachers plan lessons along with a sequence of content while beliefs about how learners learn or the resources needed become secondary. Yet believing that students should be given room to negotiate their learning process is a typical constructivist perspective. These are conflicting beliefs.

Phil gave the following explanation,

"*I don't think of students as empty vessels ready to be filled up with knowledge from lecturers, no. These students come to university with experiences and ideas of what they want to achieve therefore it is critical that lecturers draw cases and examples from real life whenever they teach. I believe in use of concrete examples when explaining concepts. Students learn better from existing mental pictures and this helps them remember easily."*

This explanation revealed that conflicting beliefs about teaching approach. The first belief exhibited the need for lecturers to employ non-traditional approaches that are student-centered. However he said he used concrete examples to help students remember easily which shows that his concern was not in the construction of knowledge by students but in recalling.

In contrast, one lecturer, Leo, believed in traditional non-constructivist approach. Leo believed, for instance, in students learning better when lecturers explain concepts and students solve multiple problems;

"*I explain concepts in the topic and provide several questions that help students absorb the taught content. It is very important that students understand what will be required of them in tests and examination, otherwise they will fail."*

This reflected the traditional teaching approach that is characterised by knowledge transmission from teacher to student and reproduction of content in exams. He reiterated this belief by saying,"… *mind you, students have to understand what I explain and also the textbook. If a method has been given, I expect my students to be able to reproduce it and apply some reasoning in future problem solving. I always try to find a variety of ways to explain myself so that all students understand and easily recall."* This explanation is typical of non-constructivist approach where the lecturer does not give room to knowing differently. All he believed in is that his explanations should be easily recalled by students.

Choice of learning activities: Tom and Phil cited the importance of knowledge construction by students as well as that of prior knowledge and experience in setting learning goals and activities. Tom explained the importance of prior knowledge,

"*I believe all students come from diverse backgrounds and bring with them a wealth of experiences which when ignored, might render my course irrelevant and boring. I always have a pre-course survey that gives me an overview of my students' prior knowledge and their expectations in the course and this guides how I plan the course activities and general approaches to teaching. For example, some students come with practical experience in the field of study and all they expect to get is a paper to prove their knowledge, you know.*"

This explanation revealed one of the elements of constructivist teaching view, students' interest, why they need the course. Phil explained, "*My experience has shown that most graduate students come to university with professional experiences and pre-determined study expectations which can't be overlooked. I usually sent out a pre-course survey with my welcome bulletin where I expect my students to explain why they think the course will help them achieve their educational goals."* He believed overlooking students' prior experiences and study interests would negatively impact on how his course was to be accepted. In constructivist view, students' interest is one of the key factors that help the lecturer decide on the teaching goals.

When asked about how he decided learning tasks for his students, Phil was quick to say, "*I use cases from real life and professional setting to allow the students to see relevance of whatever they are studying. Use of concrete examples help explain concepts better and I do*

not want to be misunderstood by my students. Mind you, adult learners do not tolerate time wasting on issues that do not help solve practical problems they face daily in their career." Phil's explanation has some contradicting themes. Use of real-life cases and his concern to meet student expectations falls very well with the constructivist paradigm but use of concrete examples is on the traditional behaviourist extreme.

The Role of the Lecturer: Two lecturers, Leo and Phil, held a mixture of the two extremes but inclined more to the traditional behaviourist notion. For instance Leo believed lecturers guide and support students so they can concentrate on what will be asked in the examination. He explained:

"*I am there to guide and support students learning, at the same time, I am guided by the curriculum and university regulations on examinations… Though I was never trained to teach I am of the opinion that a lecturer should research for up-to-date information before the lecture and my role as a lecturer is to guide students so they do not waste time studying what will not be tested in the examination.*"

This explanation revealed a mixed set of beliefs. Firstly, he viewed lecturer's role as students' guide and to give needed support. Secondly, his concern about students studying what "*will not be tested in the examination"* contradicted the initial constructivist belief of guiding and supporting students' learning process. If his expectation was to have students prepare themselves for what was to be tested in examinations, then he still held some behaviourist beliefs about learning. His guiding and supporting did not allow for learning differently but reproduction of learned content in the examination. The rest of Leo's explanations on his role

revealed more traditional inclinations than constructivist. He went on to say, "*As a lecturer, I should make sure students understand university regulations and ensure diligence to the syllabus goals. I try to make sure my in-class tests follow so much the format and regulations on final exams so that students have a feel of what the exam atmosphere will be like."*

Phil proudly proclaimed, "*I want my students to freely develop their personal interest in the course without me directing that. All I do is to make sure information gets across to my students so they can easily internalise the concepts and reproduce them during assessment. Given that I am the subject expert, I am like a vehicle driver taking students to a place where they can't take themselves - the highest echelons of increased knowledge*." This revealed that Phil understood the need for students to construct knowledge by making personal meanings freely, but he believed students had to "*internalise the concepts and reproduce them during assessment."* He believed he had to be the expert in control of students' learning as the driver to ensure students increase knowledge. He believed in student-teacher interaction was critical for ensuring students understanding and he encouraged "*interruptions during face-to-face lectures where I stop and explain finding better alternative ways of putting across my understanding of the concepts*." Phil also believed in using humour and making the content relevant through "*real-life cases and examples."* The explanations Phil gave clearly indicate that he held a blend of the beliefs, he was neither a constructivism extremist nor a traditional absolutist.

On the other hand Tom revealed constructivist beliefs about his role as lecturer. He believed he was there to guide and support students learning, at the same time facilitating critical

student enquiry. He considered himself a "co-inquirer with students" who encouraged research and gave guidance for peer evaluation. He explained,

"Post-graduate teaching is quite different from school teaching. One has to see himself as co-inquirer with his students … imagine how much a student knows already before coming for a course. It's amazing how these young generation learners research and come to class with all the facts on their finger tips. I will not fool myself by thinking I know all when information access is no longer a privilege of the so-called learned. All I do is to facilitate with learning goals and guidance." This meant that Tom had time to understand his students and considered their prior knowledge and backgrounds in his teaching so he could better facilitate the learning process. He was cognizant of the 21st century learner characteristics and did not want to be seen as stupid, instead he saw himself as partners in the quest for knowledge with his students. He added that his role was to *"define the content, set up the learning environment and make course expectations clear expecting the students to produce high quality work. These are adult students who deserve to be treated fairly and I make sure I do exactly that … of course I am fair but demanding."*

Tom believed teaching is "*a two-way process in which students have to learn to reflect on their work, be self-critical and involved in accessing their work while the lecturer assumes the role of giving mentorship and support."* He went on to say *"… graduate students are independent learners who only need someone who opens them up to their own possibilities. My role is to coax and convince them that they can do it."*

Classroom environment: All the three lecturers held some mixed beliefs about the classroom environment, although Leo was closer to traditional while Tom was closer to constructivist. They all agreed to the idea of having both lecturer and students initiate and respond to questions during and after class, but Leo added , "*most times I would want to see my students attentive and jotting down the main points for future reference rather than intercepting the flow of my lectures. Uuhm, what I mean is, one has to ask questions at the end of my presentation or when I call for questions."* Phil believed a good learning environment should "*facilitate dialogue and help students develop, unpack and repeat their own knowledge. I am not always there to spoon-feed them so they have to be engaged and learn from each other. I usually tease out some answers from them to make sure they are understanding."*

Tom preferred a learning environment that "*allows for student debate, discussion, peer assessment and teamwork."* He added, *"I involve my students by giving them some facts and drawing out some from them to ensure they understand …"* This showed that although Tom believed in engaging his students, he still put some effort in students' understanding.

Role of ICT: The three lecturers viewed ICTs quite differently although they all held negative self-efficacy beliefs towards teaching with technology. On the one hand, Tom believed ICTs played a very important role of providing "*extended classrooms in which students can further engage with the content and even with their peers. The Internet has opened up a no-boundary classroom where students can network with peers in other universities across the globe."* Used in the classroom, ICTs helped him reach out for all student learning styles as "*those who learn by sight will be able to see while those who needed a teacher's voice will hear me*

explain." He considered ICTs as "*must-have tools for any serious university lecturer*" although he feared "*ICTs evolve too fast for me to really appreciate what the tools can do for me. Technology just does not give me sufficient time to slowly learn and adapt.*" He believed this disrupted complete integration of ICTs into teaching and also negatively impacted on his desire learn new teaching theories and techniques that come with each emerging tool.

On the other hand, Leo felt that ICTs are just another tool used to enhance traditional modes of delivery. He lamented "*people impose tools without really understanding what it takes to be a university lecturer. I have to go through textbooks, plan, write notes for my students, then stand before two hundred students and dictate those notes…. then you expect me to have time to learn new tools* … [he laughed]. *It's just one of the many tool has to choose from."* He believed it was a waste of time learning what ICTs could do for him as he never learnt computers in school. Similarly, Phil felt that trying out emerging technologies was not for lecturers but the technology staff had to do that. He said, "*Technology integration is unavoidable but we cannot expect everyone to learn how to do it. I am a specialist in my area so someone who is technologically apt has to be employed to look at the technology side. It has to be a team's work if we are to achieve integration."*

Asked about what he believed about ICT capabilities, Phil felt that ICTs had great capabilities that could be harnessed to enhance student learning but feared that ICTs did not offer him enough capabilities to "*enable me to explain concepts and put across my understanding in a variety of ways for ease understanding. Assuming my writing style reaches every student may be quite dangerous as this might obviously leave some students out."* He felt ICTs were

sometimes too rigid to allow innovative teaching for those lecturers without some technical skills. He added that at times *"lack of instructional technology skills to help identify what the different technologies can do for you is a draw-back even if one has great instructional vision."*

The above analysis shows that the three lecturers who participated in this phase held similar belief orientations as in the preliminary survey. Phil held almost equally represented belief constructs thereby continuing to show transitioning orientations, while Leo remained close to traditional and Tom close to constructivist. It was interesting to further study Phil in actual practice in order to see if he really was transitioning or not.

4.3. Phase 3. Observing use of CLMS technologies in actual teaching practice

The last phase case study consisted of direct observation of the online teaching environment of the lecturer who emerged most interesting from the previous phases. Phil participated in this phase because he showed some mixed beliefs that suggested transitional inclinations. The aim was to determine how his transitioning beliefs were reflected in actual use of CLMS technologies in his teaching practice.

4.3.1. The participant - Phil

Phil was purposefully selected from the two antecedent phases. He was considered transitional in both phases as he equally held both traditional and constructivist pedagogical beliefs. Phil taught two courses in the pilot EMBA project and several other courses in the

conventional campus courses. Due to long years of experience Phil had used a wide variety of instructional technologies and had seen them evolving. During the time of the study, he was using the CLMS for both the campus F2F courses and the two online EMBA courses. For the campus courses his courses were web-supplemented meaning online participation was optional for students as they had the semester F2F contact hours unchanged. Phil's instructional goal for 2010/2011 academic year was to have at least 80% of his content for all his courses available online.

4.3.2. The Context

The EMBA courses were web dependent where participation online for each activity was compulsory requirement of taking the courses, although some limited F2F was retained. The course under study was delivered using a blended approach where Phil met his students one weekend to introduce them to the course and lay the groundwork for online interaction and learning. He also met them towards the end of the course for revision and examination preparation, and then a final course examination was administered using the traditional examination room, paper-and-pen set up. The rest of the course delivery and interaction was online using the university-wide CLMS. The CLMS technologies and tools were left to the lecturer to choose.

4.3.3. Method

In this phase data was collected using a combination of direct observation, analysis of CLMS technologies and some interview techniques to solicit and access the participating lecturer's

(Phil) belief system and technology practices reflected in the course site on Moodle CLMS. Phil and I randomly chose and agreed on one of his two EMBA course sites for study. Specific questions were deliberately asked during the online course walk-through to explore how he believed the CLMS technologies enabled or constrained his teaching practice.

The face-to-face data collection activity took place over two hours and consisted of a one-on-one walk through exercise and some guided oral discussion. I decided to have Phil walk me through his course site on Moodle providing him with a comfortable and familiar environment in which to begin his last phase participation. Some oral deliberate interjections meant to help uncover the salient thinking and decision processes that contributed to his design and practical use of the CLMS as a medium of teaching were made throughout the session.

The artifact, in this case the CLMS course website, provided a snapshot of the lecturer's pedagogical beliefs-in-action, while the semi-structured oral discussion provided the opportunity for the lecturer to reflect on the thinking that underpinned his learning design decisions. It was hoped that this process would uncover some of the thinking processes that guided his teaching practice. Ad hoc questioning was employed during the interview to follow certain lines of inquiry. This approach allowed some flexibility in the mutual construction of the account while assuring that core issues were canvassed.

The data was collected using descriptive field notes that were taken throughout the walk-through session and some on-screen snapshots of the course web-pages. These provided a contextual record of Phil's CLMS teaching practice.

4.3.4. Data analysis

Data analysis typically consisted use of the same categories and dimensions to analyze the data as the previous phases but allowing for emergent coding.

The collected data were coded by and matched to the dimensions and their scales for the belief orientation. As the exercise was designed to try and locate how these beliefs were reflected in practice, data from this exercise were coded by and matched to the, teaching philosophy or orientation, perceived lecturer's role and conducive learning environment.

4.3.5. Results

Phil's course website was generally very well presented with easy access to contents. He used a number of Moodle features for a variety of learning activities as shown in Table 11 below:

Table 11: Used Moodle features

Feature	**How it was used**
News forum:	used as course bulletin board for course announcements, welcome messages and general notices;
PowerPoint presentations and PDF files	Used to show the main points, give references and lecture notes, case studies and examples.
The lesson tool	Was used to present siseable chunks of study materials allowing for interaction and self assessment.

The discussion forum	This was very popular and widely used. The lecturer and students were able to start topics, reply to postings. It was also used for feedback and announcements.
Instant messaging	Used for real-time question-and-answer, peer-to-peer interactions and student encouragement from lecturer.
Book tool	This was used to put together all the course reading materials in book format to allow for printing and references.
Assignments tool	Used for individual and group tasks. The tasks included project-based, research and present, offline field work, upload files.
Wiki	Used for collaborative group projects and individual reflections.
Quiz	Was used as a quick assessment tool and make-up for missed assessment.
Grade book	Was used to grade assignments and give feedback to students on their performance.
Link to file or web page	Used to provide extra reading resources, case study sites and links to relevant web references.

Phil explained his beliefs about using the Moodle for online teaching quite clearly which revealed a lot about his underlying pedagogical beliefs. He believed the CLMS offered an environment where students felt less intimidated to express themselves than in big lecture theatres. He believed that the use of CLMS technologies enabled him "*to interact better with my students thereby reducing students' anxiety ...*" although he felt the technologies did not

offer him tools required to emulate the level of interaction he enjoyed F2F. Phil even felt student-content interaction before asynchronous discussion helped enrich the quality of contributions given by his students. He indicated that lecture notes, readings and content were still important, but that student interaction was a significant part of his online activities design.

On the use of online discussion, Phil felt such tools provided "*coaching and feedback mechanisms needed to achieve any realistic task …"* although he felt the CLMS offered limited capabilities as it did not allow students to use their other senses that pronounce body language. Lack of real time interjections to stop the students from side-tracking and also the unlimited amount of text that a student could contribute at a time made online discussion a little unfriendly. Although Phil felt he had some good online facilitation skills, he still struggled with students who expected him to be always online whenever they themselves were online. His students needed more from him to allow them to engage into more personalised learning. This meant he had "*extra workload that followed me home and everywhere*."

The use of project-based learning on the site provided evidence of authentic learning in practice. Phil used wiki tools for collaborative learning projects: '*the students work together in groups and interact with each other to try and complete given tasks. I recently learnt about wikis for collaborative learning and decided trying it out. My students found it quite useful especially that they are geographically dispersed.'*

The learning process, while strongly constructive through project-based learning, still has significant emphasis on the lecture PowerPoint presentations: '*these presentations and PDF files have been put onto the website to help the online students with their study'.* The use of PowerPoint files that '*help them pick out what I see as the most important things*' demonstrate that there was also a dependence on academic abstract knowledge. This appears to suggest that the PowerPoint, PDF files and indeed the 'content' of the course must be 'studied'. This kind of thinking aligns with a more knowledge-reproduction approach.

Feedback was an important part of the site: '*you can put messages up and you can give feedback, you can interact in the same way as if you have a class in front of you*'. Various mediums were utilised for feedback including discussion forums, online quizzes, instant messaging, and email. The lecturer was there to moderate online discussion postings and even to remind docile students to participate in the different topics discussed in the course.

The focus of the assessment on the course site is based around group projects and research assignments. He explained that using challenging problems in authentic contexts, and working in groups to solve the problems was ideal, however there were also examinations in the course. An end of course evaluation was also a crucial part of the course so "*that I can review my general teaching approaches accordingly and improve on all areas that came out as weak."* He, however, indicated verification of student participation in the learning and assessment processes was a real challenge that is why traditional F2F examinations were still an obligatory "*summative assessment tool*." This indicated that although Phil was moving in

the direction of constructivism with a stronger tendency towards the 'knowing differently', it was not exclusive.

4.4. Discussion and reflections

The combination of techniques used in this study appeared to be successful in eliciting knowledge of the lecturers' beliefs about using ICTs for university teaching and how that was applied in practice. The preliminary survey and the semi-structured interviews were an effective way of revealing the lecturers' implicit pedagogical beliefs while the combination of observation and interview techniques further uncover how such beliefs were reflected in the use of ICTs in university teaching practice.

A survey was used to determine the pedagogical beliefs held by the participating lecturers the study. The findings supported what previous studies (e.g. Samuelowicz, 1999, Quinlan 1997 and Bain 1998) had concluded in that teachers conceptualise teaching in qualitatively different ways. The six participants who participated in the survey represented several ways in which they thought about teaching and classroom management. Lecturers either created situations in which their students are encouraged to learn or they transmit knowledge to students (Samuelowicz 1999). This study clearly indicated that lecturers' beliefs do change either gradually or quite fast and this was demonstrated by having no single lecturer that exclusively represented either extremes of the continuum. Mixed orientations signified movement from traditional-absolutist beliefs toward the non-traditional constructivist. Four of the six survey respondents were coded as close to constructivist whilst one was transitional and another one as close to traditional.

In the second phase of the study, semi-structured interviews were used to further explore the pedagogical beliefs of three lecturers representative of the constructs found in the survey and the similar trends were noted. For instance, Phil continued showing transitional belief orientations. He believed in constructivist teaching approaches like students forming part of the setting the tone of the classroom, student engagement and collaborative learning, at the same time believing in teaching for understanding and regurgitation of content in examinations and tests.

The study further aimed to establish "to what extent do lecturers perceive ICTs as relevant to teaching and learning?" The results indicate that the more constructivist lecturers perceived ICTs as information tools where emphasis lied in the interaction between the student and the content, student and lecture and student to student. They view ICTs as providing an extension and reinforcement platform for student-centered learning. Those more traditional viewed ICTs as just any other tool that support teacher-oriented learning or as disruptive to their practice. They were generally uncertain of what the technologies can do for them and demonstrated limited or no use of ICT tools to enhance their teaching practice.

In answering the question "How do lecturers' beliefs about teaching and learning relate to their beliefs about use of ICTs in the teaching practice?" the study showed a constant relationship between lecturers' typical pedagogical beliefs and their beliefs about use of ICTs in the classroom. Ertmer (2005) suggests that teachers allow their own pedagogical beliefs to stand in way of their use of ICT, and that teachers have not conducted enough research to

prove that they need ICT in the classroom, she suggests that this is what has caused the low adoption rate of ICT in classrooms. This study showed that although it may be true that lecturers may not conduct enough research about the affordances and opportunities given by new emerging ICTs, but that does not mean that they still do not use them in their teaching practice. Educational technologies have become commonly used sources and tools for lecturers, what might differ is the type of use these tools are perceived to have.

Finally the study examined how lecturers' beliefs about teaching were reflected in the ways they use technology in their teaching. It specifically looked at CLMS technologies and the findings indicated consistence. The participant was earlier identified as holding transitional pedagogical beliefs and results of the CLMS technologies indicated that he was more constructivist in his use of the CLMS. Phil used more tools that promote collaborative learning and student-centered approaches. His continued dependence on lecture notes in PowerPoint and PDF formats shows that he still held transmissive teaching approaches. This might be suggesting that the shift from traditional beliefs is a gradual process that can only be possible once the lecturer perceives the new tools as relevant. This might also suggest that the transition might not be a deliberate and well-thought-out move but instead a natural process that comes with exposure to certain favourable environment. Given that Phil had somewhat equal presence of constructivist and traditional belief construct, it is most like that he was to use most of the technologies that support both teaching approaches.

Generally, the study indicated that most lecturers have gone beyond learning basic computer skills. They incorporated ICTs into their teaching practice in ways they believed could

transformed their teaching practice - for instance, getting students actively involved in doing collaborative learning projects; giving students more personalised attention and allowing students to learn more flexibly and independently. Most of them felt that having been exposed to ICTs and learnt how to use them, they were teaching differently and more effectively. It was also clear that the amount of experience a lecturer had with the technology was a crucial factor in transforming pedagogical beliefs and shaping the ICT integration process. The more the experience one had with the tool the more he was likely to use it in his teaching practice.

4.5. Summary of Findings

In summary, the study found that:

- Lecturers hold a mixture of pedagogical belief constructs, no one exclusively holds one belief construct.
- Lecturers' pedagogical beliefs are reflected in their use of ICTs to source and present content, manage and organise the learning environment, conceive their role in the learning process and that of their students.
- Transition of pedagogical beliefs across the continuum is a gradual process that can only be possible once the lecturer perceives the new tools and approaches as relevant;
- Some beliefs are more tacit than explicit as lecturers have not explicitly asserted them, therefore transition is more unintentional than deliberate.
- Lecturers use a situational approach to choosing what educational ICTs to use depending on the subject matter, student learning styles, context and lecturer readiness;

- Staff training (and other “conducive” external support mechanisms) may not necessarily help them think differently but may only help them appreciate the relevance (or irrelevance) of the new teaching tool;
- Changing lecturers' pedagogical beliefs is a complex and challenging process. Mandating a change in the way they think about technology or about new ways of teaching and/or learning is unlikely to be effective.
- Lecturer beliefs are so ingrained and so interwoven with their professional experiences and with what they know, that they are immune to direct manipulation;
- There is no one-size-fit-all educational technology;
- Use of ICTs in teaching reflects the pedagogical beliefs that one holds - the wider the belief spectrum the more ICT tools one uses in actual teaching practice;

CHAPTER 5

5. CONCLUSIONS AND RECOMMENDATIONS

5.1. Conclusions

This study focused on examining how Africa University lecturers' pedagogical beliefs are reflected in their use of ICTs in actual practice. The study showed that lecture beliefs are reflected in the following factors:

5.1.1. Content sourcing and presentation

In this study, it was observed that lecturers' belief styles were reflected in the ways they use the ICTs for content presentation. Given common ICT resources, the lecturers used different approaches in using these technologies in their teaching practice. The more constructivist lecturers used ICTs as tools for student "expansive and collaborative learning" while the more traditional non-constructivist lecturers believed and used these technologies as one of the many tools that provide more engaging learning activities in a transmission, presentation format.

However, as noted earlier, the lecturers have gradually transitioned to focus on developing relatively interactive activities that fit more constructivist models. They may not have substantially changed what and how they teach, but they have made it more engaging through the technology applications they learned in the online learning project. The online content presentation was a mixture of PowerPoint presentations that integrate text, audio, and powerful video; lesson tool with multimedia integrated; book tool that presented content in a more lineal unit-to-unit study material; and links to other websites. Like any dedicated

lecturer, the lecturers wanted their students to learn what they were learning, and love the material they found engaging.

The pedagogical beliefs were also reflected in the ways the lecturers controlled the use of the Web as a content resource. The more traditional lecturers bookmarked websites and controlled the information sources for searches. In contrast, the more constructivist gave their students free access to search on their own, within guidelines that they have agreed to previously. All the lecturers recognised that the web provides multiple viewpoints and perspectives which was more of a concern to the non-constructivist lecturers. The more constructivist lecturers found this to be one of the most important reasons to use the web, and mentioned that they hoped to use this diversity as a vehicle for helping students learn to search and evaluate a range of sites. It also became a way for them to let students share what they knew and could do as an extension to the F2F contact, giving the students a chance to extend their reach and aspirations.

5.1.2. Lecturer Roles

The study showed that lecturers who believed their role was to guide and support students learning used technologies that supported critical inquiry, feedback, peer review and extension of the classroom. They allowed students to initiate discussion topics and participate in ongoing discussions, while the non-constructivist used the same tools for notices and suggesting further reading material. This means that non-constructivist lecturers only allowed for one-way communication from the lecturer to the students.

The more constructivist lecturers reported that they often relied on students to help them with the technology, giving the students more responsibility and subtly bringing change to the "lecturer as the master of knowledge" mindset. Despite their more traditional teaching beliefs, the lecturers felt comfortable admitting that their students were often better on the computer than they were. Learning new instructional tools was a daunting task for the non-constructivist which gave them limited choice of tools to use.

The more constructivist lecturers saw their students as "co-inquirers" with them, which means that they no longer considered themselves more knowledgeable. This belief helped them to learn from their students and appreciate that students come to class with some experiences they themselves did not have. This was also reflected in their inclination towards technologies that allowed for more collaborative and interactive learning such as wikis and discussion forums. Lecturers' transitioning beliefs were also reflected in their use of technologies that supported both transmissive and constructivist approaches, making them use more technologies and CLMS features to deliver and support learning.

5.1.3. Management and organisation of the learning environment

In the study it was also observed that technology has had an impact on what transpired in the learning environment, both face-to-face and online. Access to various technologies and staff training made the lecturers feel a responsibility to use these resources. The more constructivist lecturers believed in active and lively learning environment dominated by student discussion

and participation, thereby choosing such tools as discussion forums, web research and interactive presentations. Those more traditional believed in learning environments where students had to comply with the lecturer's authority and strict deadlines. This was reflected in the use of technologies that supported strict deadlines such as setting CLMS penalties for late assignment submission, and also assigning individual tasks.

Technologies that afforded opportunities for group work and project-based activities were common in constructivist classrooms. Even online students were grouped and assigned collaborative tasks using such technologies as wikis and blogs to report back and such collaborative products were availed to the entire group for peer review and as reference materials.

The study results indicate that lecturers held some mixed pedagogical beliefs and that they all were at varied stages of transitioning. The results suggest that all participating lecturers are using ICTs for teaching and learning, and that differences in use do not imply resistance to change. The lecturers are willing to use diverse teaching technologies as long as they appreciate what the technologies can afford them and these affordances support their pedagogical beliefs. The study findings also suggest that for one to use a wide range of ICT tools there is need for holding a wide spectrum of pedagogical beliefs.

This study also uncovered that changes in pedagogical beliefs may affect uses of technology while use of technology may affect beliefs about teaching and learning. This means, either technology affects lecturers' implicit beliefs or the lecturer beliefs affect how technology may

be used in teaching. Technology affects lecturer beliefs when the lecturer would have explored new emerging technologies and effectively adapted to the new learning environment. He/she would have come up with new maps for the new teaching terrain and has either accidentally or deliberately changed some of his/her beliefs. At times he/she may not have fully adapted to the environments, but may be in a transition. His/her beliefs would be undergoing a process of transformation as a result of being in new teaching and learning environments. For such lecturers, technology serves as the change agent or a catalyst, forcing them to rethink or re-evaluate their practices and beliefs.

The other case is where lecturers' pedagogical beliefs affect use of technology. Some lecturers in this study indicated that their ICT use was changing as a result of their open-mindedness and eagerness to try out new tools. Others, however, expressed their frustration with the inability of these technological tools to meet their needs. They held beliefs that were not supported by the available ICTs.

5.2. Recommendations

In the light of the above conclusions, it is recommended that the units involved in staff training should continue to expose lecturers to as many ICTs as is possible so as to widen the choice for lecturers. Making ICTs accessible and giving enough appreciation of their affordances can help lecturers achieve their teaching with technology goals and become more flexible in their teaching approaches.

The study also indicates that lecturers' pedagogical beliefs are heterogeneous and thus reflect a wide range in terms of the evolution of teaching approaches and ICT use. Professional development sessions should continue to provide all lecturers with opportunities to evolve their beliefs so that they might be more compatible with teaching and learning in new digital environments.

While lecturers may have different pedagogical beliefs and teaching approaches, it is recommended that the university avails diverse instructional technologies, support and training in order to ensure other alternatives to knowledge transmission and to teacher-centered pedagogies.

Although there are distinctions and inconsistencies in lecturers' pedagogical beliefs, it is recommended that these differences and inconsistencies be reconciled through opportunities for reflection on and examination and discussion of the lecturers' beliefs. Such opportunities may include lecturer participation in the development of institutional policies, in-house development initiatives.

5.2.1. Recommendations for further research

This study revealed that there are many areas related to lecturers' pedagogical beliefs and use of ICTs for university teaching about which we know little and which would merit investigation. This study recommends that further research be conducted on:

- The relationship between other discipline lecturers' pedagogical beliefs and their use of ICTs in teaching practice of the university;

- the relationship between students' learning beliefs and their perceptions about the role of ICTs in their learning
- the impact of using a standardised CLMS as the best option suitable for all teaching at Africa University
- how lecturer pedagogical belief system is formed and transformed /dynamics of belief change.

Generally, additional related research, including use of alternative methods is needed to ensure conclusive establishment of the findings.

5.3. Significance of the Study

This study was timely and appropriate with regards to the Africa University strategic plan, developments and direction in relation to ICT access and use for teaching and learning. Although one person's findings is not enough to conclusively establish findings, the study informs both institutional practice and add a valuable dimension to national and international literature regarding lecturers' pedagogical beliefs and use of ICTs for teaching practice; and that of university lecturers in developing contexts.

The results of this study are going to help inform:

- strategies to ascertain how best to address weaknesses in the current implementation of ICT-enhanced programmes at Africa University;
- change advocates' appreciation of why lecturers do not always adopt and use ICTs in ways advocated for;
- understanding of issues about access and use of ICTs for university teaching

- staff development and support strategies to ascertain effective uses of technology that facilitate student learning;
- inform literature on university lecturers' pedagogical beliefs and how these beliefs link to ICT use in the actual teaching practice.

5.4. Limitations

- The respondents might have been protective of their practices and might not willingly divulge issues that put them in bad light.
- My work relationship with the respondents might have influenced the responses the respondents gave as they were well aware of the teaching approaches I advocated for during staff development sessions.
- The time allocated to the study made it impossible to observe more participants in the actual teaching practice.

5.5. Overall Summary of the study

The study set out to examine how Africa University lecturers' pedagogical beliefs are reflected in their use of ICTs in actual practice. A sample of six lecturers from the Faculty of Management and Administration who taught on AU's online EMBA pilot programme was used and the methodology used was a qualitative multi-case study approach with an interpretivist perspective. A survey, semi-structured interviews and observation were used to gather the data. The study was prompted by my professional encounters with supporting

teaching with technology initiatives at AU and the need to understand some intrinsic factors that impact on use of ICTs in teaching practice.

The study was fairly easy as the participating lecturers were very willing to give information although some were a bit defensive or uncomfortable in exposing information that would imply incompetence. Some lecturers tended to exaggerate their confidence and defended their choices or brushed it to work schedule overload. In spite of the limitations, interesting findings and observations were made.

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http://www.africau.edu/mozambique/embadescription.html

http://www.africau.ac.zw/

APPENDICES

Appendix 1: Survey Results

Table 12: Survey responses grouped according to the belief constructs

Response Item	Joe	Phil	Tom	Leo	Lisa	Don
Constructivist Teaching						
2. I believe that expanding on students' ideas is an effective way to build my teaching strategies.	6	5	5	1	6	5
4. I invite students to create many of my bulletin boards.	Nr	4	2	5	5	5
10. I teach subjects separately, although I am aware of the overlap of content and skills.	5	5	5	4	5	4
12. I involve students in evaluating their own work and setting their own goals.	5	5	3	3	3	5
16. I adjust my lesson plan based on results of homework assignments.	5	5	5	4	5	5
17. I make it a priority in my classroom to give students time to work together when I am not directing them.	6	6	4	6	6	5
20. I encourage students to discuss conflicts in group meetings.	6	6	5	6	6	5
24. I guide students in finding their own answers to academic problems.	6	3	6	5	4	5
29. I encourage students to follow up on classroom activities with individual enquiry/research.	6	6	6	6	6	5
30. I believe in developing my classroom as a community of learners.	6	5	5	6	6	6
31. I encourage students to suggest ideas for arranging our classroom.	6	4	3	3	6	4
34. I often create thematic units based on the students' interests and ideas.	6	5	3	2	6	5
35. I encourage discussions of different opinions and reasons.	6	6	4	4	6	5
36. I believe it is important to involve students in revising classroom and virtual learning environments rules as needed.	6	4	5	6	6	6
Constructivist Management						
7. Provision for moral support, guidance and counseling is an essential part of my teacher role when out-of-the-classroom problems are interfering with a student's learning.	5	6	6	5	6	6
8. I operate a democratic classroom because I believe it promotes social learning.	6	4	4	6	6	5
11. I encourage students to propose and negotiate new classroom rules if they feel the current rules are not working.	6	5	3	3	4	5
18. I encourage students to solve internal problems independently when doing group work.	6	5	4	4	6	5
19. I would describe my students as co-managers of classroom procedures and events.	6	4	5	2	6	5
22. For assessment purposes, I am interested in what students can do independently.	5	6	5	4	5	6
23. I encourage students to resolve conflicts independently.	6	5	4	4	5	3
27. I function in my classroom as a learner and partner in learning with my students.	5	5	5	2	4	4

38. When students request my assistance, I turn the decision-making responsibility back to the student.	6	5	4	2	6	5
40. I view conflicts between students as opportunities to foster their social and moral development.	6	6	5	2	6	3
42. I encourage students to monitor their own behaviours rather than comply with my authority.	6	5	4	5	5	5
Behaviourist/Traditional Teaching						
1. It is important that I establish classroom control before I become too friendly with students.	6	5	4	Nr	6	5
6. I base student grades primarily on individual assignments, quizzes, and tests.	5	4	4	6	4	5
9. To be sure that I teach students all necessary content and skills, I follow a textbook or workbook.	4	4	6	3	5	3
15. I believe students learn best when there is a fixed schedule.	2	4	5	6	3	4
25. I generally use the lecturer's guide to lead class discussions on particular topics.	4	5	6	4	3	3
26. I prefer to assess students informally through observations, seminars/webinars, discussion contributions and presentations.	5	5	5	2	3	3
28. I find that textbooks and other published materials are the best sources for creating my teaching materials.	6	4	5	6	6	4
37. I believe students learn most effectively when learning tasks are broken down into small sequential steps.	6	5	4	5	6	5
39. It is more effective to provide students with the information they need to know, rather than encouraging them to experiment.	4	6	4	3	3	2
41. I believe that encouraging competition among students motivates them to learn more.	6	4	5	6	4	4
Behaviourist/Traditional Management						
3. I prefer to cluster students' desks or use tables so they can work together.	4	4	3	3	4	Nr
5. I like to make course choices for students because they can't know what they need to learn.	2	2	2	6	4	2
13. I wait for students to approach me before offering extra help.	2	5	3	2	5	4
14. When there is a dispute between students in my classroom, I try to intervene immediately to resolve the problem.	4	4	4	6	4	5
21. I immediately tell students the correct answers when they cannot figure them out by themselves.	2	5	5	6	5	2
32. It is more important for students to learn to obey rules than to make their own decisions.	6	5	3	4	3	2
33. When rules don't work, I change the rules based on my professional judgment.	6	4	3	5	3	4

6='strongly agree' 5='agree' 4='somewhat agree' 3='somewhat disagree' 2='disagree' 1='strongly disagree' Nr= 'No response'

There were only three "no response" cases.

Appendix 2: Informed consent

Study Topic: An examination of how Africa University Lecturers' pedagogical beliefs are reflected in their use of ICTs in teaching.

Researcher: Unity Chipunza, Med - ICT candidate, University of Cape Town.

Purpose of the Research: The present study arose from my professional practice. In my work as e-Learning specialist, staff developer and advisor in teaching with ICTs, I have observed some striking differences in Africa University lecturers' use of ICTs for teaching and learning. I need to understand the underlying factors that impact on AU lecturers' adoption and use of ICTs in teaching in general, with particular interest in understanding how pedagogical beliefs are evidenced in the use of ICTs in teaching.

Having started piloting the online EMBA programme in Maputo it is of critical importance to engage in ongoing checks and balances that will help to model the idea of setting up other Africa University satellite campuses. The university administration and staff envisage the Maputo project as the proof of concept initiative that will inform the creation of other satellite campuses in other nations of Africa such as Angola, Liberia, Nigeria, Sierra Leone and DRC which will be included in future. It is therefore from this background that I seek to understand intrinsic factors that impact on the use of ICTs in teaching and learning.

What You Will Be Asked to Do in the Research: You will be asked to thoughtfully provide answers to questions here attached. There is no wrong or right answer but you will be expected to give earnest and well thought out answers to the presented questions.

Risks and Discomforts: I do not foresee any risks or discomfort from your participation in

the research.

Voluntary Participation: Your participation in the study is completely voluntary and you may refuse to answer any question or choose to stop participating at any time. Your decision not to volunteer will not influence the support and services that you are currently receiving from the researcher, or the nature of your relationship with Africa University either now, or in the future.

Withdrawal from the Study: You can stop participating in the study at any time, for any reason, if you so decide. Your decision to stop participating, or to refuse to answer particular questions, will not affect your relationship with the researcher or Africa University. Should you decide to withdraw from the study, all data generated as a consequence of your participation will be destroyed.

Confidentiality: All information you supply during the research will be held in confidence and, unless you specifically indicate your consent, your name will not appear in any report or publication of the research. Your data will be safely stored and only the researcher will have access to this information. Confidentiality will be provided to the fullest extent possible by law.

Questions about the Research: If you have questions about the research in general or about your role in the study, please feel free to contact Unity Chipunza, Med. In ICT candidate at the Centre for Educational Technology, University of Cape Town, e-mail: chpuni001@uct.ac.za or chipunzau@gmail.com This research has been reviewed and approved for compliance with research ethics protocols by the University of Cape Town Human Participants Review Committee and conforms to the standards of UCT Ethics

guidelines. If you have any questions about this process, or about your rights as a participant in the study, please contact the researcher.

Legal Rights and Signatures:

I, _____, consent to participate in *the Med-ICT research project* conducted by Unity Chipunza. I have understood the nature of this project and wish to participate. I am not waiving any of my legal rights by signing this form. My signature below indicates my consent.

Signature **Date**
Participant

Signature **Date**
Researcher

Appendix 3: Lecturers' pedagogical beliefs survey

Directions: As you respond to this Survey, tick on the button under each statement to indicate how much you disagree or agree with the statement. There are no right answers so respond thoughtfully but quickly.

1. It is important that I establish classroom control before I become too friendly with students.

   Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

2. I believe that expanding on students' ideas is an effective way to build my teaching strategies.

   Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

3. I prefer to cluster students' desks or use tables so they can work together.

   Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

4. I invite students to create many of my bulletin boards.

   Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

5. I like to make course choices for students because they can't know what they need to learn.

   Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

6. I base student grades primarily on individual assignments, quizzes, and tests.

   Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

7. Provision for moral support, guidance and counseling is an essential part of my teacher role when out-of-the-classroom problems are interfering with a student's learning.

   Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

8. I operate a democratic classroom because I believe it promotes social learning.

   Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

9. To be sure that I teach students all necessary content and skills, I follow a textbook or workbook.

   Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

10. I teach subjects separately, although I am aware of the overlap of content and skills.

    Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

11. I encourage students to propose and negotiate new classroom rules if they feel the current rules are not working.

    Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

12. I involve students in evaluating their own work and setting their own goals.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

13. I wait for students to approach me before offering extra help.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

14. When there is a dispute between students in my classroom, I try to intervene immediately to resolve the problem.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

15. I believe students learn best when there is a fixed schedule.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

16. I adjust my lesson plan based on results of homework assignments.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

17. I make it a priority in my classroom to give students time to work together when I am not directing them.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

18. I encourage students to solve internal problems independently when doing group work.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

19. I would describe my students as co-managers of classroom procedures and events.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

20. I encourage students to discuss conflicts in group meetings.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

21. I immediately tell students the correct answers when they cannot figure them out by themselves.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

22. For assessment purposes, I am interested in what students can do independently.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

23. I encourage students to resolve conflicts independently.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

24. I guide students in finding their own answers to academic problems.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

25. I generally use the lecturer's guide to lead class discussions on particular topics.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

26. I prefer to assess students informally through observations, seminars/webinars, discussion contributions and presentations.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

27. I function in my classroom as a learner and partner in learning with my students.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

28. I find that textbooks and other published materials are the best sources for creating my teaching materials.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

29. I encourage students to follow up on classroom activities with individual enquiry/research.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

30. I believe in developing my classroom as a community of learners.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

31. I encourage students to suggest ideas for arranging our classroom.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

32. It is more important for students to learn to obey rules than to make their own decisions.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

33. When rules don't work, I change the rules based on my professional judgment.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

34. I often create thematic units based on the students' interests and ideas.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

35. I encourage discussions of different opinions and reasons.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

36. I believe it is important to involve students in revising classroom and virtual learning environments rules as needed.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

37. I believe students learn most effectively when learning tasks are broken down into small sequential steps.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

38. When students request my assistance, I turn the decision-making responsibility back to the student.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

39. It is more effective to provide students with the information they need to know, rather than encouraging them to experiment.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

40. I view conflicts between students as opportunities to foster their social and moral development.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

41. I believe that encouraging competition among students motivates them to learn more.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

42. I encourage students to monitor their own behaviours rather than comply with my authority.

Disagree Strongly ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 Agree Strongly

********* Thank you for your participation. *********

Please return all completed questionnaire to: Unity Chipunza, ETU Office, ICT department.

Appendix 4: Interview Protocol

Interview Protocol

Directions: Give as much information as you can possibly give. There are no right answers so respond thoughtfully but quickly.

1. How long have you been using ICTs for teaching?
2. Tell me about your teaching philosophy:
    a. What comes to your mind when you think about teaching?
    b. How do you decide on instructional goals and objectives
    c. How do you select the activities and resources?
    d. How do you make use of students' interests and priorities
    e. Where do you think you acquired this (teachers' college, teaching experience, reading)?
3. Has it changed over time?
4. Compared to when you began teaching with ICTs how much (less than then, same as before, more now, never did) do you employ practices such as:
        i. Plan lectures using direct instruction? Use textbook as primary guide through units?
        ii. Have many activities going on at the once in the room?
        iii. Closely monitor and supervise students on topics in the lesson?
        iv. Evaluate students on products as opposed to tests?
        v. How much have computers played a role in the changes noted?

5. Compared to when you began teaching with ICTs how much do you (less than then, same as before, more now, never did):
    a. Have students teach and help each other?
    b. Have students explore a topic on their own without direction? Have students review and revise their own work?
    c. Have students work on long projects?
    d. Have students work in groups?
    e. Have students make predictions and investigate them?
    f. How much have ICTs played a role in the noted changes?
6. How would you describe your computer skills when you started teaching with ICTs (specifically on EMBA-Maputo)?
    a. How would you describe them now?
    b. If changed to what do you attribute the change?
    c. Have you changed the way you use technology since you started on EMBA-Maputo?
    d. Have you changed your teaching? (Explain)
7. What is it that you like best about technology?
8. What is your biggest frustration with technology
9. What are your personal goals for teaching in the next five (5) years? What role does technology play?
10. What other questions should I have asked you?